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Journal OF THE AMERICAN DIETETIC ASSOCIATION

PUBLISHED BY THE AMERICAN DIETETIC ASSOCIATION

Business Goals and Accounting Tools — *Neva Henrietta Radell*

Research, Fads, and Practical Dietetics — *Robert E. Olson*

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Anti-Thiamine Effect of Bracken Ferns — *Sukondha Samruatruamphol and Helen T. Parsons*

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VOLUME 31
NUMBER 8

Journal OF THE American Dietetic Association

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Business Goals and Accounting Tools[1]

NEVA HENRIETTA RADELL, Ed.D.

Professor of Business Administration, Pratt Institute, New York City

IN THE past, we concentrated on *food* cost control; now it is cost control applied to *all* expenses. The most pressing expense today is the cost of personnel, since wages have increased over the years until rates are more nearly equal to the standards of industry. Then, there are also the costly fringe benefits, such as federal old age and survivors' insurance, state unemployment insurance in the commercial enterprise, workmen's compensation insurance, medical examination, policies for sick leave, and vacations, in addition to the regular laundry and meals for personnel. The Economic Research Department of the Chamber of Commerce of the United States recently reported (1) an itemized list of employer costs and employee benefits totaling $720 per year per employee.

Because the margin of income over expense is very narrow, the enterprising food service organization or department is considering seriously all costs, scrutinizing them, and re-evaluating the service received for each. Only recently I was told that in a large chain of restaurants, one man was assigned the problem of controlling the cost of gas used as fuel; within a short time, he had saved more than twice his annual salary. He demonstrated a waste of fuel even in boiling water. He used a thermometer in the water as it came to a boil with its reading of 212°F. He then let the pot boil over a burner turned on full—and demonstrated that the temperature still remained at 212°F. An employee does not forget such a demonstration. It is always more effective than any written or oral suggestion.

In my experience over the past few years, it has become evident that food service administration has divided itself into three general groups: the hospital dietitian, who started this great Association; the school food service director and manager, with a national organization of considerable size, the American School Food Service Association; and third, the commercial manager, represented by the National Restaurant Association.

There is much overlapping and much in common between these fields of specialization and their organizations. For instance, in the hospital, there has developed the non-profit personnel pay cafeteria, which is operated on a self-sustaining basis. This operation calls for every cost control as well as good merchandising. Isn't this a commercial operation? The school lunch has become almost a billion-dollar business and represents in many cases the first meal that a child eats outside the home which he pays for. This has great impact on his future nutritional habits, and there is unlimited opportunity for the school food service director. It takes just as much control to operate a non-profit food service as a profit-making one. The industrial cafeteria, where millions have at least their noon meal, is considered more commercial, yet it is operated non-profit with a controlled clientele. Perhaps it falls in this category, because it operates within a recognized business enterprise and under strict business management.

What, then, is the difference in the administration of our food services? The objective in every case is to serve the best possible meals at the lowest cost to the patron or customer according to the standards and policies set up by a governing body. There is a payment for the meal in every case, whether direct or through a central office, and we hope by a satisfied person.

IMPORTANCE OF THE BUSINESS APPROACH

Another flash-back comes to my mind. In beginning my work on the business side of food service, almost everyone interviewed would say, "I have nothing to do with the business or record side of food service; all that is done in the business office." Business attitude and cost control are today so much a part of food service management that the two cannot be divorced. Records are not controls in themselves. It is their effect on the thinking and planning by management as their interpretation reveals what has happened that provides the control. The *use* of the record is in the hands of the manager not the accountant, bookkeeper, or clerk. All of you have used precontrol with costed recipes, menus, and

[1] Presented at the 37th Annual Meeting of The American Dietetic Association in Philadelphia, on October 29, 1954.

special functions, but do you follow this with a measure of accomplishment?

Speaking last year in Los Angeles, Dr. Anthony J. Rourke set forth a real challenge to dietitians which was published in the JOURNAL (2). He said: "I believe that the profession of dietetics is deficient in the arts and skills of modern management. Such arts and skills can easily be acquired, and every effort should be expended towards their early acquisition. The day is not far off when we shall have dietitians whose science and management will be excelled by no one and whose spiritual motivation will result in an unbounding amount of happiness and satisfaction."

If we accept this challenge, our goals are severalfold—for our profession, our institution, and ourselves. But, they blend into one single goal. If we find ourselves in a position in which we are moderately successful and live a full and happy life as a person, our institutions and departments will profit and we shall be good representatives of the field of dietetics or, more broadly speaking, of food service administration. This may attract others to our profession.

If any of you have ever attended a board meeting of a business or any monthly or annual meeting, you will observe that the dollar-and-cent goal is the most potent and meaningful to any organization. This is business thinking today, and without question it will be the same in the future. Survival is the main problem of business, and this includes all institutions whether public or private.

Without a specific goal and a constant measure of achievement, leadership lacks drive. Why does a selling organization set up goals or quotas for its salesmen? Without such stimuli it would never reach the maximum in sales. Have you personally ever set up a money goal for yourself and worked toward it consciously and unconsciously? You will be enlightened at what can be accomplished.

TOOLS OF ACCOUNTING

Business organizations set up goals in the form of financial budgets—something to reach for and hold to. Through the use of a budget, it may become apparent that some departments may need expanding and others curtailing, in order to have an equitable distribution of the funds available. Having a budget is of little value unless a system is set up whereby the operation may constantly be checked. Therefore, accounting and statistical reports guide us in our activities. What do these contain which may be called precision tools? Some of the precision tools for the hospital department of nutrition are food cost and personnel cost per meal served or per day's meals for one person. It is easier to compare a unit cost of 40 or 50 cents than large dollar figures. Unit costs also make possible comparisons with other institutions. Where it is possible to have a sales figure, another precision tool is the percentage food cost or the ratio of food, personnel, and other expenses to sales.

If a daily cost sheet is not maintained, a monthly report should be prepared on time, so that some analysis can be made and the results used promptly.

It has always been my feeling that the accounting has been too much apart from the activity and management of food service. Get acquainted with the business office and its personnel. One research project revealed that the food service department and the business office were not very close; most contact was by a written memo or telephone call and then chiefly to clear up errors or minor questions on procedure. By closer association, real help can be obtained from most central, financial, or accounting office personnel. Remember that they must learn about your department, too, in order to understand your problems.

In this same project, there was also an inquiry about the chart of accounts used for the department. This means the classifications of income and expenses used on the books and in the reports. The question brought a most inadequate answer. The American Hospital Association has published a *Handbook on Accounting, Statistics, and Business Office Procedures for Hospitals* (3) which contains detailed information on accounts for all departments. It is my hope that in the near future the American School Food Service Association will adopt a uniform classification for the school lunch. An example of such a classification, developed over a period of fifteen years, is suggested in my own publication, *Accounting for the School Lunch* (4). The hotels adopted a *Uniform System of Accounts for Hotels* (5) thirty years ago, which is important enough in that field that lawyers, in purchasing a London hotel, attached it to the contract for the purpose of interpretation of the meaning of all terms.

Once we know what the figures are for a department or organization, it is the use we make of them that counts. How can a better over-all job be done? Can we serve more attractive menus, new dishes, perhaps larger servings, more variety, and different-appearing food items? Shape or cut is important. For example, children can be encouraged to like liver by cutting it in small strips before cooking; these pieces can be handled with the fingers. This little trick I have told to grown-ups who are now finding liver more palatable.

A suggestion for controlling personnel costs is to make a graph showing the hours employees work; this is excellent in uncovering overmanning and undermanning. Across the bottom of the sheet are the working hours. On the left side is a list of the personnel by groups. A line represents each employee and is drawn across the hours he works.

Learn about the fringe benefits available to your employees. Study old age and survivors' insurance

under the federal Social Security system so that you can help employees when they come to you with some erroneous ideas. There is an excellent new motion picture on this insurance which can be obtained free from your area office of the Social Security Administration, United States Department of Health, Education and Welfare.

To feel the pulse of the entire department or organization, I suggest you prepare a comparative or perpetual operating statement summary by entering each monthly statement on a columnar sheet of accounting paper with one column representing each month of the year. The account titles will appear to the left in the same order as in the individual statement. Copy each month's figures in its proper column, and your comprehension of every figure will be multiplied ten times. By just your writing the figures, you get the "feel" of them, comparing each with that of the previous months and seeing their relation with what has actually taken place in the operation. And, incidentally, if it is known that you do this, the office will undoubtedly try to be more prompt in getting the statement to you. Your active interest in the results will be used unconsciously in your day-by-day planning.

RESIDENCY IN ADMINISTRATION

Next, what are you doing to promote your professional growth? For the dietitian or manager who wishes to progress toward administration, long-term planning is in order. One path to such development lies in directed experience which might be called a "residency," that is, a position which has been set up for the purpose of growth through new and different duties and activities in administration. If, let us say, a hospital dietitian has been through the usual four years of college, one year of internship or its equivalent, and worked as a dietitian for five or ten years or even more, he or she wants advancement. It is evident today that few such dietitians want more of the same kind of education—a review or extension of their past experiences. They desire a new approach and responsibilities which broaden their scope and, we hope, bring them new, better, and more influential positions. Residency experience is in the present and future planning for physicians and surgeons, administrative nurses, lawyers, and professors, teachers, social workers, and those wishing a career in government services. Why not for dietitians?

The program at Teachers College, Columbia University, when there was an Institution Management Department which was affiliated with the Food Service Department, offered an example of one kind of residency. Students studying for their master's degrees came to the College with various lengths and types of experiences in the field of dietetics and food management. During their work toward their degrees, they held responsible positions as accountants and food controllers. The positions were full-time, and courses were carried on a limited program. A similar plan is now being carried out at Pratt Institute with students working for their bachelor's degrees.

recently wrote to these "residency" people, whom I had supervised for some twelve years, and asked them to contribute to this paper, by giving me statements to quote. Several are members of The American Dietetic Association.

One of these former "residents" received both a bachelor's and master's degree and honors in auditing from Columbia's School of Business. Developing as she studied and worked, she was able to accept a position with an accounting firm serving hotels and large food service organizations on the West Coast. After several years with this firm, she was employed by one of the clients where she had an assignment, and now has been promoted to the position of Internal Auditor with that company. Last year she became the first woman to be elected to membership in the Los Angeles Auditing Association. This is what she wrote: "My years at Teachers College taught me that without accurate, up-to-date records, a food service operation cannot function efficiently. Food cost and salary percentages must be available daily in order to make the necessary decisions which ultimately will result in a month-end profit for the operation or cause it to compare favorably with its predetermined budget."

Another, now in a position of leadership as Director of Food Service and Nutrition of the Hartford, Connecticut, Public Schools, has served for two years as treasurer of the American School Food Service Association. She said in answer to my question as to what the time spent as accountant and food controller did for her professionally: "It broadened my previous experience in dietetics and management by new approaches to: food costs, perpetual inventories, accounting procedures, time and motion studies, new equipment, new methods of production and management. It gave me close association with instructors of institution management who had national prestige in their subject and also, I was able to watch other projects carried on by graduate students which could not have been accomplished if not done on a 'residency' basis."

A third graduate, who is employed as Senior Nutritionist or Consultant in the New York State Department of Social Welfare, says: "Being in charge of the accounting office gave me a much better picture of food service in its entirety. It made me better able to work with institutional stewards in making up food budgets, in working with food service staffs in the utilization of inventories and keeping of perpetual inventories as well as staying within the budget allowances."

The School Lunch Director in South Bend, Indiana, says: "It's just like everything else—one

learns best by doing and can always talk with confidence about something he or she really knows. After the experience as accountant, there is no doubt in one's mind but that she knows the basic accounting needs for proper food cost control. I have just completed the installation of a uniform system for all the school lunchrooms here."

The Assistant to the Director of the School Lunch Program in Great Neck, Long Island, who spent one year with us following an internship at Presbyterian Hospital, New York City, commented: "The experience gained as accountant and food controller gave me, among other things, an understanding of the basic business procedures so essential to the successful operation of any food service. Aside from learning the mechanics of bookkeeping by use, it developed an ability to interpret records and to determine what factors were influencing the financial success or failure of the business. Food control experience is becoming an increasingly important requisite for the dietitian seeking employment. The lack of such business experience may lose for the dietitian much of her prestige and has, in some instances, caused her to lose her supervisory capacity in the food service. Professionally, I have gained from my accounting experience a confidence enabling me to talk intelligently with those in charge of business affairs as well as others with whom I am affiliated. Such experiences should gain, not only for me but for all others in the dietetic field, recognition as truly professional people."

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Safe Methods of Cooling Cooked Meats

Tests to learn the best methods of handling cooked meats to prevent the development of microorganisms have been conducted in the laboratories of Swift & Company, Chicago.

Beef rib roasts, beef pot roasts, beef stew, beef and pork meat loaves, pork loin roasts, smoked hams, roast turkeys, country-fried chicken, stewed chicken cooled in broth, and stewed chicken and broth cooled separately were used. All meat left to stand at room temperature remained uncovered; when refrigerated, all cuts were covered loosely with waxed paper to prevent dehydration.

Three different methods of cooling were tested: (a) immediate refrigeration after the meat was served, which allowed for a lapse of about 20 min.; (b) standing at room temperature for 2 hr. prior to refrigeration; and (c) standing at room temperature until cooked meat reached 80°F. (approximately room temperature).

Records were kept of the time and temperature curves during the cooling period, and the length of time the meat remained in the 110° to 60°F. temperature range (the "danger zone" for bacterial growth) was analyzed. Bacterial incidence was also determined, as was acceptability by a taste panel judging flavor.

Findings indicated that most meat may safely either be left at room temperature for 2 hr. or refrigerated immediately. The rate of cooling for the first 2 hr. seemed to be about the same with both methods. Also, flavor scores indicated no spoilage with either treatment. It was noted, however, that large roasts, stuffed turkeys, and meats in broth or gravy took so long to cool by either method that there was some danger of spoilage. Holding cooked meats at room temperature long enough to cool thoroughly in all cases was found to be potentially dangerous.

The following procedures are recommended to speed cooling and thus keep cooked meat safe: Meat and broth or gravy should be cooled separately. Hot broth should be put into a bowl or wide-mouthed jar, and 1 qt. quantities cool more quickly than larger amounts. A kettle of broth may be set in a pan of running cold water to cool rapidly before refrigeration. Broth should be stirred to prevent formation of a top coating of fat which may seal in the heat. Leave both meat and broth uncovered until cooled. Then cover or wrap loosely to prevent excess drying.

Spread pieces of meat in a flat pan to cool more quickly. Don't stack hot cooked chicken or other meat. Large roasts may be cut in two to cool faster.

Remove the stuffing from a turkey and cool both separately. An unstuffed turkey cools as quickly as turkey meat removed from the bones.

Keep cooked meat cold in the refrigerator. Store cooked meats properly and use them within one or two days to enjoy best flavor, juiciness, and satisfaction without danger of spoilage.—*Ruth Dudman, Food News and Views, Bull. No. 107, April, 1954.*

Research, Fads, and Practical Dietetics[1]

ROBERT E. OLSON, Ph.D., M.D.

Department of Biochemistry and Nutrition, Graduate School of Public Health, University of Pittsburgh

ALTHOUGH a topic stretching from nutrition research to food faddism is a broad one, it is no more broad than the scope of the field of dietetics itself. Indeed, it highlights some of the problems with which all of you deal in the course of an average day. Contributions from research laboratories in the field of biochemistry and nutrition flood the scientific literature. The dietitian and nutritionist are expected to interpret these in order to keep abreast of current knowledge of nutrients, the interrelationships between nutrients, and their role in the maintenance of health and the prevention of disease. In addition to the science of nutrition, the dietitian must know something about the behavioral sciences of psychology, economics, sociology, and anthropology because she deals with people as well as food. An understanding of the emotional involvement with food of the faddist who is claiming benefits from a "health food" and the emotional conflict of a patient who rejects a therapeutic diet are integral parts of the job of a nutritionist or dietitian. Both the mumbo-jumbo of the faddist and the food misinformation of the unhappy patient must be suitably decoded, interpreted, and used in as constructive a manner as possible.

I should like to consider with you: (a) some general aspects of the problem of food faddism, (b) some aspects of the chronic disease problem as it has been influenced both by research and by food faddism, and finally (c) some areas of dietetic practice which I believe will be developed in the near future.

We might well ask ourselves how it is that food faddism can co-exist with our modern scientific knowledge about nutrition? It not only co-exists but flourishes as a profitable business devoted to the sale of health foods, vitamin tonics, cancer cures, and reducing aids to the tune of about a half billion dollars per year (1). On the other hand, our knowledge of the nutritional requirements of man, the interplay of the various nutrients in biochemical systems, and the factors in illness which produce malnutrition are at an unparalleled stage of development, even admitting that many problems, particularly in the area of the relation of food to chronic disease, are still in an experimental stage. Why, then, should food faddism and misinformation persist and influence some ten million Americans yearly?

EMOTIONAL APPEAL OF FADDISM

Food faddism persists, I believe, despite incontrovertible scientific evidence denying its special validity, because an effective appeal is made by faddists to the emotional drives of people and not to their intellects. We know that emotional drives far outcarry intellectual ones. It has been said that "whenever the reason and the imagination are in conflict, the imagination will win." The problem of dealing with emotions in relation to food not only bears on the problem of food faddism but on many problems of diet therapy encountered in a bona fide medical setting.

Knowledge of the emotional value of food is, of course, much older than knowledge of its nutritional value, both in the historical and in the individual biologic organism. One of the most primordial of human urges is that of eating. When prehistoric man foraged for food, he did so to satisfy his urge to eat and to survive and not to satisfy his nutritional requirements. Food is even more meaningful to people today as a symbol of love and gratification, as a sign of emotional and cultural identification, and as badge of prestige and social position than it is as a source of nutrients for growth and metabolism. Food may even serve as a weapon of interpersonal warfare between giver and receiver.

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From childhood, food is treated as a symbol of emotional value rather than as a source of calories. In the infant, food intake is usually associated with love, pleasure, protection, and comfort. Adult persons with emotionally barren lives may still turn to food as a substitute for affection, and this overeating frequently leads to obesity. In other circumstances, food intake may be associated with guilt feelings which can lead to anorexia nervosa (2).

The food faddist often appreciates this symbolic value of food better than those of us in scientific nutrition. Ponce de Leon's search for the "fountain of youth" is an immortal one. The faddist's claims are extravagant and sensational, varnished with half-truths and buttressed with a money-back guarantee. Is there any wonder that the overworked housewife with tired back, tired legs, tired "libido," and "tired blood" grasps for the health product when all else seems to fail.

The food faddist, furthermore, must deal with the palpable article. His product must be seen, smelled, tasted, and swallowed. His product is *it*. Claims of nutrient values may be made, but the sales emphasis is placed upon the special qualities of the finite product. It is usually "natural," "organic," "unprocessed," or "raw," and preferably of weird origin.

The nutritionist, on the other hand, is concerned with nutrients regardless of how the foods are packaged, processed, or grown. Enormous progress has been made in the analysis of the food essentials. Some fifty purified chemicals will now support growth in the rat, and it is probable that the identity of nearly all of the factors of importance in human nutrition is known. Although important areas of research still remain, particularly in the area of interrelationships between nutrients in the metabolism of both the sick and the healthy, our knowledge is certainly enough to invalidate 98 per cent of the claims made by food faddists regarding the nutritional effect of their products. I leave 2 per cent open for further study since we are reminded of the fact that one or two older ideas about special effects of food on illness have held up fairly well. I am thinking particularly about the value of lemon juice in scurvy and fresh meat in pellagra.

The dietitian has an enormous job. Showered with scientific facts and figures about nutrients and nutritive values of the foods she deals with, plagued with emotional blocks in patient and personnel, pressured by health food peddlers, and distracted by food misinformation, she must steer a middle course, acting as scientist, teacher, father-confessor, mediator, and psychotherapist. Hers is a difficult role. She is to be complimented on the skill with which she carries it out.

MORE KNOWLEDGE NEEDED

We have spent some time contrasting the value of food as a symbol of emotional value and as a source of nutrients. We have tried to visualize how the symbolic value of food is exploited by the faddist and how important it is for the dietitian to retain a broad perspective in dealing with food fallacies and misinformation as well as with other aspects of her work. Let us next review some of the recent scientific findings made by nutrition researchers in the field of chronic disease and contrast these with claims made by food faddists.

Nutritional requirements for normal human beings are reasonably well known and are based on documented clinical studies. Little information is available, however, on the nutritional requirements of patients with various illnesses, such as arthritis, arteriosclerosis, cancer, sprue, ulcerative colitis, cirrhosis of the liver, diabetes, and other chronic metabolic, vascular, or neoplastic disorders. The very admirable summary of our present knowledge of therapeutic nutrition prepared under the auspices of the Food and Nutrition Board of the National Research Council by Dr. Herbert Pollack and his colleagues (3) concludes with this statement, "The recommendations concerning nutritional requirements for various disease states covered by this report are based upon the limited knowledge available at present and should be considered tentative pending further research results." Let us look at the effort being made by both the researcher and the faddist in the areas of obesity, atherosclerosis, and diabetes.

OBESITY

Obesity has been labeled as one of the most important health problems in America today. This assignment of priority to obesity as a problem is due in large measure to its extraordinary association with chronic degenerative disease. Although Hippocrates noted this association in 400 B. C., Dublin and Marks have made a more impressive analysis by studying 250,000 life histories of persons insured by the Metropolitan Life Insurance Company (4). What precisely this association means in terms of causal relationships is not clear. Some of us have jumped to the conclusion that because of this association, it is mandatory that every fat man and woman reduce his weight to avoid these illnesses and be assured of reasonable longevity. Although some direct adverse effects of excess weight upon certain physiologic systems are apparent, many of the more serious effects on metabolic, vascular, and digestive systems are inapparent at the moment and are the subject of increasing study. How, for example, is obesity *per se* related to hypertension, cholecystitis, atherosclerosis, and diabetes mellitus? Many other determinants besides obesity influence the health of the obese patient, and it is up to the clinical investigator to attempt to analyze the pertinent factors which are operating.

Recent evidence from the laboratories of Gofman

(5) and Ancel Keys (6) suggests that dietary fat may be more important than depot fat in stimulating atherogenesis in the obese patient and precipitating one important complication of obesity, namely coronary artery thrombosis. The relationship of obesity to abnormal glucose tolerance and diabetes mellitus is still unclear and requires further study. At the University of Pittsburgh we have recently initiated a clinical study of obesity to determine whether reduction in total calories or a change in the proportion of the nutrients with particular attention to fat is of more importance in improving the health of the obese patient. It is our feeling that in dealing with this problem the emphasis should be placed on *health* and not on *weight* until the data are more complete. Further, it may well be that weight loss is crucial in the prevention and management of some but not all of the illnesses which threaten the obese. Present evidence suggests that hypertension and diabetes mellitus may be in the former category.

It is axiomatic, of course, that a weight reduction program should be supervised by a physician. We have all seen adverse effects from too zealous attempts to reduce weight, including the recurrence of rheumatic fever and asthma, precipitation of attacks of coronary insufficiency and gout, flare-ups of thyrotoxicosis, and severe mental depression even with addiction to alcohol. Many of these complications are in the area of psychosomatic illness; we forget sometimes that obesity itself is a psychosomatic illness and its management a challenge rather than a chore.

The problem of achieving weight reduction in the obese patient is by no means easy to solve. The drive to eat is enormously hypertrophied in most obese patients as a part of their general defense against an unfriendly environment despite their protestations to the contrary (7). The basic mechanism regulating food intake becomes deranged as a result of these psychic stimuli.

Investigators have been studying the basic mechanism of food intake for a long time, and this field of research has attracted renewed interest recently because of the problem of obesity. The urge to eat, like other urges, is a function of activity within the central nervous system. Brobeck (8) likens the mechanism to a complex reflex arc centering in the hypothalamus. Various sensory stimuli, both somatic and visceral, funnel through this nervous center at the base of the brain and activate a motor system which results in food intake. The hypothalamus is also concerned with other urges, such as the sex drive and the sleep drive; moreover, it mediates such important body functions as regulation of the autonomic nervous system and heat and water balance. Nervous stimuli associated with these latter functions of the hypothalamus are thus strategically located both to inhibit and facilitate the appetite reflex. Inhibitory stimuli include emotions like fear, gastric distention, food "metering" in the mouth and pharynx, dehydration, heat, and drugs, such as amphetamine. Stimulatory ones include emotions like anxiety, gastric contraction, cold, hypoglycemia, and mild sedative drugs.

It is clear, I believe, that the drive to eat is a very complicated mechanism influenced by many psychologic and physiologic variables. It would be difficult to single out one major determinant of appetite in man. On the other hand, the psychic components governing appetite in the obese require sympathetic, non-punitive evaluation by both dietitian and physician.

The faddist has taken advantage of the popular interest in obesity and its relation to disease. Far from trying to distinguish cause and effect, he has capitalized on the public's worship of the Hollywood figure and its fear of illness and early death. Some faddists pay lip service to the laws of energy intake and expenditure, but many advertise that with the aid of their preparation, no dieting is necessary. Many of these diet aids are simply vitamin- and mineral-supplemented candy, sweetened skim milk powder concentrates, or inert bulk-producing compounds. Even granulated sugar has recently been advertised as an aid to dieting on the basis that blood-sugar level is the major determinant of food intake in man (9). These claims, of course, are unfounded and merely remind us that both experimental (10) and clinical studies (11–13) support the hypothesis that high-protein, moderate-fat intakes are more conducive to comfortable weight reduction than a high-carbohydrate regimen of the same caloric value.

ATHEROSCLEROSIS

Much research is also being carried out in the field of atherosclerosis. More and more evidence is accumulating to support the general hypothesis that *one* factor related to the genesis and progression of this illness is the level of circulating serum lipid and lipoprotein. On the other hand, there appear to be numerous other local factors of importance which are inherent in the arteries, arterioles, and in the circulation generally. Gofman's latest formula for the calculation of atherogenicity (14) includes factors for a broad range of lipoproteins, age, and diastolic blood pressure. The question of whether total serum cholesterol or any species or combination of species of serum lipoproteins containing cholesterol is a better index of the state of the serum lipids in regard to atherogenicity is not settled yet but may be answered in the near future by the U. S. Public Health Service, which is currently analyzing the results of its four-year cooperative study of serum lipoproteins.

Obesity is associated on the average with an increased mortality from coronary artery disease (15)

and post-mortem evidence of increased atherosclerosis (16). It must be pointed out, however, that the correlation between degree of overweight and serum cholesterol or serum lipoproteins is not particularly high. Further, Yater *et al.* (17) have reported 866 cases of coronary artery disease occurring in U. S. Army personnel which showed that the distribution of weights did not significantly differ from 297 soldiers of equal age and length of service killed in military accidents at the same time. Since obesity is due to overeating, the possibility of excess dietary intake playing a role must not be overlooked. In fact, Keys has adduced epidemiologic evidence from a study of Americans, Englishmen, Italians, and Spaniards that coronary artery disease is related to the intake of dietary fat (18). Dietary cholesterol, on the other hand, seems completely unrelated to the level of serum cholesterol and the incidence of atherosclerosis in man; and this fact should allay the fears of those who prefer eggs for breakfast.

Is there a diet therapy for atherosclerosis? It is not yet adequately formulated. The existing data suggest that fat restriction may lower serum cholesterol to a certain extent. Reducing diets have been shown both to decrease (19) and increase (20) the serum cholesterol level. Long-term clinical studies to determine the effect of fat and protein levels in the reducing diet on serum cholesterol and the incidence of atherosclerosis are not yet available.

Arguments have been advanced deprecating the idea that diet therapy for atherosclerosis is feasible on the grounds that the body continually synthesizes cholesterol and other lipids from smaller molecules generated in intermediary metabolism. It must be remembered, however, that the evidence to date implicates the *level* of circulating lipid and not the rate of over-all synthesis of intracellular lipid as being related to the process of atherogenesis. Only if metabolic turnover of lipid affects the serum level does it appear that atherogenesis will be influenced.

The basic mechanisms of the biosynthesis of cholesterol are, nevertheless, of great interest, and recent advances in our knowledge of this subject have been made. It has been known for some time that acetate is an effective precursor of cholesterol in the animal body. The intermediate steps in the synthesis, however, have been obscure. It now seems reasonably clear that the first step is the condensation of two molecules of acetate to yield acetoacetate (21). Another molecule of acetate (acetyl-CoA) then reacts with acetoacetate to form β-methyl-β-hydroxy-glutaric acid which undergoes decarboxylation and reduction to yield an *isoprene* radical (22). The isoprene units are then polymerized to squalene, a long chain hydrocarbon which then cyclizes to yield cholesterol (23). This mechanism of biosynthesis is of particular interest because isoprene units appear in a wide range of plant products, including the terpenes, camphors, natural rubber, and the fat-soluble vitamins A, E, and K.

DIABETES

The third chronic disease I should like to touch upon is that of diabetes mellitus. The pathologic physiology of this disease, though recognized clinically by the first physician ever to practice, in 1500 B.C., is still quite obscure. The discovery of insulin has made the regulation of diabetes possible, but today, thirty years after its discovery, biochemists are still investigating its exact physiologic function. Exhaustive biochemical studies to date suggest that insulin has a multiple role in cellular physiology. It stimulates the uptake of glucose by cells, speeds the conversion of acetate to fatty acids, and provides the necessary conditions for the protein-anabolic action of growth hormone (24). Further studies of the metabolism of insulin have revealed the presence of an enyzme, *insulinase*, which decomposes insulin in the peripheral tissues, and of various inhibitors of this enzyme in foods and tissue extracts (25). Insulinase explains the need for a daily secretion of the islet hormone, and the interplay between this enzyme and its inhibitors if abnormal may be responsible for the genesis of certain types of diabetes mellitus. Conversely, further study of this problem may provide practical clinical tools for the better regulation of this chronic illness.

Studies in the field of vitamin-hormone interrelationships in the person with diabetes have shown that there are abnormalities in the metabolism of both thiamine and vitamin B_{12}. It appears that the conversion of thiamine to cocarboxylase, the active co-enzyme form of the vitamin, does not proceed normally in diabetic organisms (26), and this may be related to the occurrence of diabetic neuropathy. Studies at Johns Hopkins University have revealed some interesting differences in the behavior of diabetic patients toward administered vitamin B_{12} (27). Patients with uncomplicated diabetes retain excessively large amounts of this vitamin. Diabetic patients with vascular and renal complications, on the other hand, retain minimally small doses of the vitamin and demonstrate higher serum levels (28). This difference may reflect a heightened adrenal cortical activity in diabetic persons with retinopathy and other vascular complications (29).

Many fallacies about the diet therapy of diabetes have been propounded. Most of them are completely unfounded as your own Association has pointed out (30). Some have been based on incomplete knowledge of the physiology of diabetes. Fifteen years ago, all diabetic diets were calculated with regard to the ketogenic-antiketogenic properties. Every practitioner had his favorite list of do's and don'ts, and confusion reigned.

The coming of the exchange lists of foods and the recent standardization of diabetic diets through the joint activities of The American Dietetic Association, the American Diabetes Association, and the Diabetes Branch, U. S. Public Health Service has been a great advancement. It has resulted in a more rational approach to diet therapy in this illness, avoided monotony of diet for the patient, and made teaching of this subject to both patients and students much easier.

THE FUTURE

In conclusion, I would like to say that as our knowledge of nutrition advances from studies in both the laboratory and in the clinic, the responsibilities of the dietitian and nutritionist will grow. We think now in terms of sodium restriction for the edematous patient; caloric restriction for the obese; potassium and protein restriction for the uremic patient; and high-protein, high-vitamin diets for the patient with cirrhosis of the liver. I foresee an era of modern therapeutics in which dietary management will go far beyond our present relatively crude prescriptions. It is not difficult to visualize a need for attention to amino acid, trace mineral, and lesser known B-complex vitamin requirements as further research delineates more exactly the pathologic physiology of innumerable chronic diseases. Already, there is evidence for the need of specific amino acid restriction as an adjuvant to the chemotherapeutic management of leukemia, trace mineral supplementation in anemia due to uremia, and "lesser vitamin" administration to patients deprived of their intestinal flora by virtue of the effectiveness of modern day antibiotics.

To implement this newer knowledge of nutrition, I feel that the exchange system so effectively used in the management of diabetic patients should be extended to other diets requiring quantitative definition of a nutrient. Extension of the system to low-sodium diets has already been accomplished. In our own clinic, we have been experimenting with different exchange systems for diets low in calories, fat, purines, and the amino acid, methionine. Future needs for specific diets could well result in extension of the exchange system to include lists for almost every nutrient.

This system would standardize therapy for specific needs, relieve the patient of dietary monotony, and reinforce the importance of nutrients rather than foods in nutritional management. If vigorously publicized and accepted, it could spell the death knell of food faddism which, as indicated earlier, enshrines the *food* and avoids the *nutrients*.

Finally, let me say that although this *standardization* is good, we must not standardize our thinking. Research will continue to supply facts about nutrition, nutrients, and the relationship of these to our pressing chronic disease problem. We must, therefore, avoid feeling that current diet therapy is codified. We must remain open minded about the nutritional requirements of sick patients until further investigation has established them with greater certainty. We must also remember that our knowledge is of no value to our students or patients unless we can communicate with them in a meaningful and sympathetic way. The horizons are unlimited; and with these attitudes, progress will, I believe, be inevitable.

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Arizona is Training for Emergency Feeding

Arizona is proud to have been the locale for the first real grass-roots Civil Defense training project in the Southwest. Elsie H. Morris, Extension Nutritionist, University of Arizona, Tucson, reports that about two years ago the Cochise County Council of Homemakers Clubs of the Agricultural Extension Service requested help from the Home Demonstration Agent in promoting a training program in mass emergency feeding techniques. They wanted to be ready and able to go into action on short notice in the event of any disaster—flood, tornado, or atomic attack. The unique feature of the program which developed was that the original request for help originated with the homemakers themselves and thus was not imposed upon them by an organization. The success of the undertaking was due to step-by-step planning and the cooperation of associated agencies.

The Extension Nutritionist and the Home Demonstration Agent worked closely with personnel from the state and regional Civil Defense offices, first in planning and then in conducting three leader-training meetings. Subject matter for these meetings, which was presented by professionals in the area, included:

a. Quantity cookery.
b. Planning and service of modified diets.
c. Lists of small equipment for food preparation.
d. Personnel for teams, together with their duties.
e. Kitchen management and flow charts of traffic.

In addition, at each meeting, the trainees were charged with preparing a meal, so that they, in turn, could return to their groups and train members for such emergency duties.

Attendance was gratifying. At the first meeting, forty-five homemakers from eight communities, representing eighteen women's organizations attended. In addition, twelve representatives of cooperating organizations were present. Although the last two meetings were smaller, representation from the various organizations of the area continued to be good. That the leaders were motivated to pass on their knowledge is seen by the fact that seven emergency meals were later served by organizations trained by these leaders.

Material used at these leader-training meetings was duplicated and distributed to participants. Titled "Mass Feeding—A Manual for Homemakers," this material was considered so helpful by the Arizona Director of Civil Defense that it has now been sent to the Southwestern Regional Civil Defense office and referred to the national Civil Defense headquarters in Washington.

In evaluating the program, the leaders point to three accomplishments: (a) There are now trained groups of homemakers along Highway 86, an evacuation artery across the state, which are able to feed large groups through their existing community organizations. (b) The Agricultural Extension Service, in assuming its educational role, developed with cooperating state agencies a tool for future training of homemakers in other counties as the need arises. (c) The State Director of Civil Defense found that the Agricultural Extension Service, in cooperation with other state agencies, is able to train homemakers to provide adequate mass emergency feeding in their communities.

Nutrition and Fetal Growth[1]

EDWARD C. HUGHES, M.D.

Professor of Obstetrics, State University of New York, Medical Center at Syracuse

THE general metabolism of living matter, either vegetable or animal, depends on the many physiologic cellular processes which go on in each individual cell. Although there are many factors which affect these chemical and enzymal reactions, environmental conditions of these cells exert the greatest influence. Obstetricians, nutritionists, anatomists, and particularly the embryologists are particularly aware of these relationships when considering the growth and development of the embryo while *in utero*. Although heredity and the general nutritional status of the mother affects the growth of the embryo, the physiologic mysteries going on within the uterus play the greatest part in embryonic nutrition. This fetal nutrition, which includes adequate oxygen supply, not only is a strong factor in the immediate status of the fetus, but also has a remote relationship on the future life of that individual.

Altered physico-chemical processes within the uterus may not only result in embryonic death and resolution, but also may have a direct bearing on the causation of congenital malformations. Like all other processes of the body which are involved in cellular nutrition, the minute cellular reactions are stimulated mostly by the secretions of the endocrine glands. Therefore, as the secretion of the thyroid causes increments in the general bodily metabolism, as insulin from the pancreas controls the usage of glucose, as the adrenal steroids affect the retention and release of sodium and water and the metabolism of protein, likewise the secretion of the ovaries and later the placenta play the essential role in intrauterine metabolism provided for the embryo. So, as we approach the problem of conception, intrauterine fetal growth, and the preparation of the new individual for the rigors of the external world, we realize that these hormonal relationships to fetal nutrition are of extreme importance. We also recognize that many of the difficulties of fetal development and growth are the results of inadequate intrauterine nutrition. Although the nutritional needs of the embryo and the fetus vary almost daily during its intrauterine life, the process by which such metabolism is carried on also changes almost as frequently.

I would like to discuss some of the processes involved in intrauterine fetal nutrition, dividing these processes into three phases which will cover the overall nutritional needs of the fetus during the various stages of its development.

PHASE I

Phase I may be considered as the time when the uterus is being prepared for the possibility of implantation of a fertilized ovum. This phase proceeds regularly from puberty until the menopause and is of great importance. During this time the ovum, a sensitive cell, is cast out of the graafian follicle from the ovary into the peritoneal cavity and finds its way into the Fallopian tube. This cell is free from blood supply and nutrition except for the few cells surrounding it after its expulsion from the follicles which furnish it with glucose. Nature thus allows it to pack its own lunch until it can rely on the secretions of glucose from the Fallopian tube. It must be remembered, also, that the sperm must rely not only on a small amount of glucose within its own body, but particularly must depend on environmental secretions of the intrauterine cavity for its nutrition until it can reach the Fallopian tube where it fertilizes the ovum.

After fertilization has been accomplished and this combination cell begins to grow, it passes down the tube into the interior of the uterus where it must implant itself on the endometrium or the lining surface of the uterus. Once it has arrived within the uterus, it must receive its nutrition from this highly secretory membrane until it establishes its own blood circulation. There are many intricate metabolic processes occurring in the endometrium which provide nutritive substances for the ovum. These environmental circumstances must be considered as one of the most outstanding features of nutrition for the beginning of human life, and should any derangement of the physiologic processes occur, the growth

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and the development of the new structure may be affected. The fertilized ovum arrives in the uterus as a free floating structure without blood supply and must depend on these secretions for its early growth. The preparation of the endometrium and the many metabolic processes which go on within this tissue are under hormonal control.

Hormonal Control

The anterior lobe of the pituitary gland secretes several hormones which have an active part in creating the metabolic changes that occur within the uterus. The follicle-stimulating hormone from the pituitary affects the follicle of the ovary, matures it, and prepares it so that it may extrude a normal ovum or egg. A second hormone, designated as luteinizing hormone, causes the follicle of the ovary actually to rupture and allow the egg to be cast out into the peritoneal cavity and then into the Fallopian tube. Luteotrophin, a third hormone, affects the remaining portion of the follicle, designated as the corpus luteum, causing it to become active and secrete progesterone. The follicle during its development secretes a substance called estrogen. Estrogen and progesterone have a marked effect on the endometrium, causing this highly secretory tissue to proceed through the many chemical processes that occur daily during the menstrual cycle. There are several units of the endometrium which carry on the metabolism of these substances. Estrogen probably causes the tiny vascular units, called the spiral arterioles, to increase in length and to bring a greater blood flow to the endometrial glands. These glands, which can be considered as a second unit of the endometrium, metabolize and secrete the nutritive materials necessary for ovular nutrition. The third unit of the endometrium, called the stroma, is important as a nutritive base for the early embryonic cells.

As the blood flow to the endometrial glands increases under the influence of estrogen, these glands become extremely active and metabolize many substances. However, the substance which is metabolized in the greatest abundance is glucose, which is most important and probably causes most of the growth of the conceptus during its early implantation days. There are other materials such as nucleoproteins, the B vitamins, ascorbic acid, oxygen, and fluid which are present in the tiny glandular structures and which are increased in amount after ovulation has taken place. Because glucose is metabolized in such great abundance in the endometrium, I would like to discuss some of the features of its metabolism in the endometrium.

Metabolism of Glucose

Glucose is brought to the endometrial glands by the spiral arterioles. The glands absorb the glucose and convert it into glycogen for storage. At first, the glucose is metabolized and stored as glycogen at the bases of the cells of the endometrial glands. After ovulation, the glycogen proceeds to the periphery of the cell and into the lumen of the glands. At that point, by polymerization it is changed back to glucose for use by the ovum as it implants itself on the surface of the endometrium.

There are many enzymes involved in this process, the most important of which is perhaps alkaline phosphatase. Alkaline phosphatase is first noted in the endothelial cells of the spiral arterioles and then in the epithelial cells of the endometrial glands where it seems to precede the deposition of glycogen. It moves, after ovulation, to the periphery of the epithelial glandular cells and then into the lumen of the gland. The amount of alkaline phosphatase found in these structures is directly proportional to the activity of the tissue and also to the amount of glucose being metabolized. In other words, glucose is metabolized in the endometrium as it is in the liver. Glucose is polymerized by the action of the phosphatase enzymes to glycogen and deposited as such. It is also changed back to glucose by the reverse process, so that it can be used by the fertilized ovum. This whole process changes daily from month to month and can be rather accurately evaluated by histologic, chemical, and histochemical methods (1–2).

Abnormal Endometrial Function

Although endometrial function is carried on with considerable regularity from month to month from puberty until the menopause, there may be some alterations in the process. It may vary in a perfectly normal woman from month to month. It may change with the season of the year, and it may be altered by certain changes of the body. Changes in the endocrine functions alter the activity of the endometrium most specifically. For instance, the pituitary may fail to secrete adequate amounts of the gonadotrophins to stimulate the ovary to function (3–7). The thyroid may also enter into this endocrine relationship and affect the secretion of the pituitary and the ovary. The ovaries themselves may be anatomically abnormal, having a tough tunica albuginea and even though they are stimulated, ovulation may fail because of the thickness of this capsule. When ovulation does not take place, the output of estrogen and progesterone is diminished. The uterus itself may be anatomically abnormal. The endometrium may have fewer numbers of the endometrial glands and its blood supply may be deficient. Therefore, even though estrogen and progesterone are produced by the ovary, the endometrium is unable to respond to this stimulation.

Certain general changes in the body affect this entire process. For instance, loss of weight due to poor diet may derange these glands. Therefore, a deficient diet is an important cause of abnormal endometrial function. Or, in some individuals, weight may increase by overeating or by disturbed function

of the endocrines. As the weight increases, the function of the glands may be changed and the intrinsic metabolism of the endometrium may be altered. These individuals may fail to menstruate, sometimes having amenorrhea for several months or even years. One must always be aware of the possibility of diabetes mellitus in this type of individual. Psychologic imbalance, frustration, and worry may also inhibit this physiologic process. It has been noted in universities and hospitals that girls approaching examination time may fail to menstruate for several months. When the anxiety of the examination has been released, this process is again established in a normal way. Inasmuch as life is full of these stresses and strains, it is no wonder that there are various graduations of function which may alter the nutritive processes in these organs and affect the implantation and growth of the fertilized ovum. We are sure that failure of the endometrium to provide adequate nutritive substances for the early implanting blastocyst not only affects the development of the embryo itself, but has a marked effect on the formation of the chorion, the covering of the embryonic structure.

PHASE II

Phase II continues from the implantation of the fertilized ovum until the complete formation and function of the placenta. Although the length of this phase may vary, it can be considered to extend for approximately 120 days of the gestation. During this time many changes occur within the uterus and also in endocrine relationships. The important developments during these days are the formation of a satisfactory chorion and the secretion of the important chorionic hormone, designated as chorionic gonadotrophin.

The Chorion

The chorion is the outer covering of the blastocyst or the fertilized ovum. It is made up of fetal cells and also is composed of many tiny projections which protrude from the surface of the ovum. These little projections, called chorionic villi, are covered by two layers of cells called the syncytium and an inner layer named Langhan's cells. These two types of cells have varied functions in relation to development of the embryo. It must be remembered that the blastocyst floats into the uterus free from blood supply. It must then necessarily seek its nutrition as soon as possible in order to survive. It finds such material in the secretion of the endometrial glands and stroma.

The blastocyst immediately implants itself generally in the uppermost portion of the uterus. It seeks its nidation there because the food supply is the most abundant at this level. It immediately eats itself into the endometrium. This is done by the production of an enzyme which dissolves the endometrium and allows the blastocyst to sink into its depth. It may be that alkaline phosphatase secreted by the very early embryonic chorionic villi may be the enzyme which assists in this process. Once the blastocyst has implanted itself into the endometrium, it is completely covered up and receives its nutrition by the process of osmosis, taking materials from the endometrium. The growth and development of the chorion is perhaps the most important process in the whole cycle of events, but it must depend on the secretions of the endometrium for its growth. Therefore, inadequate food supply in the endometrium may affect the development and growth of the chorion.

It is also important that the chorion develop rapidly so that it may secrete the pituitary-like substance, chorionic gonadotropin, which is probably the most important hormone during the entire pregnancy. This is true because it has a specific luteinizing effect on the corpus luteum of the ovary. The corpus luteum has been retained as the pregnancy occurred. The action of chorionic gonadotropin on the corpus luteum is to stimulate it to secrete increasing amounts of estrogen and progesterone, which cause marked increase in the vascularity of the endometrium of the uterus which we now call the decidua. The estrogen causes a specific increase of blood flow to the decidua while the progesterone causes the endometrial glands to become highly secretory and provide more food material. Even the stroma of the decidua becomes edematous, containing considerable amounts of fluid which serve as the source of liquid for the chorion and embryo.

It is important that the chorion be developed as soon as possible for other reasons, too. Another important function of the chorion is to store food for the embryo. It does this in considerable abundance during its active period. Although there are probably many substances stored by the chorion, glucose is found in the greatest abundance. We have observed that during these early gestational days glucose is metabolized in the decidua and also is stored in the Langhan's cells and in the stroma of the chorionic villi. Alkaline phosphatase must play a part in this metabolism, even though it cannot be found in significant amounts either in the endometrial glands or the chorion. However, it can be noted in the spiral arterioles of the decidua and also in the tips of the chorionic villi. Therefore, the chorion becomes the most important structure during these early gestational days.

Secretion of Chorionic Gonadotrophin

The secretion of chorionic gonadotropin starts as soon as the chorion is implanted into the endometrium. Langhan's cells, which secrete this hormone,become extremely active soon after implantation. However, the height of their activity occurs between the fiftieth and seventieth days of gestation. Therefore, the secretion of chorionic gonadotropin

parallels the activity of Langhan's cells. The amount of chorionic gonadotropin found in the urine increases steadily and reaches a peak during this twenty-day period. There is a great variation in the amount of this material secreted by these cells. If the chorion is extremely active, caused by large amounts of nutritive material in the decidua, the output of chorionic gonadotropin increases proportionately. However, if the chorion is not growing actively, owing to a deficient decidua, the secretion of this hormone is decreased. The level of secretion of chorionic gonadotropin by the chorion averages 30,000 ovarian hyperemia units per day (one ovarian hyperemia unit being equivalent to 3 I.U.) (8–10). If the secretion of chorionic gonadotropin by the chorion is exceedingly high, the amount of progesterone put out by the corpus luteum will also be more than usual, and it will be excreted in the urine as pregnandiol in greater quantities. This is a particularly good combination. A large amount of chorionic gonadotropin and pregnandiol generally means that the pregnancy will proceed to term without difficulty (11, 12).

If the amount of chorionic gonadotropin does not rise to a good level, it can be assumed that the chorion is not actively growing and some deleterious effects may result (13–15). These effects may be noted in lack of output of progesterone by the ovary, and as a result, the nutrition of the blastocyst may be decreased and abortion may result. In some instances, even though the amount of chorionic gonadotropin is secreted in exceedingly high amounts, the ovary may be of poor quality and may fail to respond to the action of this hormone. In that event, the decidua will be hypofunctioning, the chorion will fail to grow, and an abrupt decrease in the secretion of chorionic gonadotropin will occur.

Therefore, an important cycle of events is established after the ovum is implanted on the endometrium. An endometrium secreting large quantities of food will cause a rapid growth of the chorion. Rapid growth of the chorion will cause increased secretion from Langhan's cells which will stimulate the corpus luteum to put out greater quantities of estrogen and progesterone. The increased amounts of estrogen and progesterone will, in turn, cause the decidua to produce more nutritive materials. When this happens, the pregnancy proceeds without difficulty, because the nutrition of these vital embryonic cells will be satisfactory. This intricate endocrine and nutritional relationship is exceedingly important to the satisfactory development of the embryo during its early stages of formation.

Even with these hormonal and nutritional changes, the general metabolism of the patient is not increased. She does not have an increase in her appetite at this time, but is inclined to feel tired, exhausted, and wants to sleep most of the time. In some instances, there is considerable nausea and vomiting, and as a result, there is nutritional imbalance. However, it seems that these general deficiencies do not affect, particularly, the embryonic development. It can be noted that in the case of severe nausea and vomiting of hyperemesis gravidarum, the patient rarely aborts and the formation of the embryo seems to be carried on satisfactorily. The amount of chorionic gonadotropin secreted by the chorion is generally higher in such a patient. It is essential, however, that the patient should be given adequate amounts of carbohydrates and various vitamins which are involved in the metabolism of sugar, particularly ascorbic acid and the B vitamins. It is evident that the important processes during these times are those which are carried on in the uterus.

The Embryo

During this process, the embryo is forming and developing but is not growing proportionately. The body cavities are being sealed off, and the new individual is in the process of making. The greatest fetal growth does not take place until after the placenta has been completely formed. The embryo does not carry on great metabolic processes as it does later in gestation. Rather, it relies upon the chorion for its nutrition. For instance, the fetal liver during this period does not carry on the process of glycogenesis as it does after the placenta is formed. The liver at this time is more concerned with the formation of blood cells. Therefore, the embryo is not the important structure during these days, but is of the secondary concern to the development of the chorion. If the chorion fails to provide nutrition for the embryo, it may die and may be completely absorbed. This is found in some patients who are in the process of aborting.

PHASE III

Phase III is the stage of placental function. It is the time of gestation, starting with the complete formation and function of the placenta which occurs at approximately 120 days of gestation and continues until the birth of the child with its placenta. The important events which occur during this time mostly involve the general maternal structure and greatest fetal growth. During this period, the maternal body as a whole undergoes great metabolic activity and at the same time the fetus grows and increases markedly in weight.

Changes in the Maternal Structure

There is marked alteration in the hormonal relationships in the body during Phase III. Chorionic gonadotropin, which during Phase II was the important hormone, now is secreted by the placenta in only small quantities, because the cells of Langhan's, which secrete chorionic gonadotropin, either die out or become other structures of the placenta at about the 120th day of gestation. How-

ever, a few of these cells remain in the placenta and still secrete a small amount of chorionic gonadotropin. This hormone is not the important one during this phase. The placenta does produce increasing amounts of ovarian-like steroids or estrogen and progesterone in large amounts during this time. Whether the syncytial cells or other cells of the placenta are actually carrying out this secretory function is not known. The amounts of estrogen and progesterone increase steadily until several weeks prior to the parturition, when, due to placental aging, secretion of these hormones decreases slightly. The placenta probably secretes other hormones, as yet undiscovered. It is possible that it may produce an adrenal-like substance which may have actions similar to those of the adrenal steroids. The pouring out of such large quantities of steroids by the placenta into the circulating blood of the mother has a definite effect on other endocrine glands of her body. The thyroid, for instance, becomes larger, increases in activity, and the basal metabolic rate in normal patients increases to an average of plus 18 in the last trimester of gestation. The maternal adrenal hormones, (poorly soluble in water and resembling desoxycorticosterone), designated as salt-and-water hormones, are increased slightly more than those which are freely soluble in water. The increased secretion of this former substance may create the retention of salt and water which can be detected during this time of pregnancy. Even the pancreas may secrete more insulin during this half of gestation (15–24).

Therefore, the maternal structure, under the increased stimulation from hormones from the placenta, undergoes a marked increase in the general metabolism. There are many clinical changes occurring in the body as the result of such stimulation. The weight increases about 20 lb., the patient has a feeling of well-being and has a great source of energy and heat. The appetite, which until this time has not been stimulated particularly, increases markedly, so that most patients have an intense desire to eat and drink excessively. They also may have unusual desires to eat food high in salt content. In many instances the avaricious appetite which develops during this building period is uncontrollable. It may be exaggerated by fear and worry. It is also increased by the patient's own inability to control her desires. It is therefore important to appreciate that the general increased metabolism is a strong factor in the growth of the fetus during these months.

Fetal Growth

The growth of the fetus during this phase of gestation is truly dramatic, increasing in weight from approximately 280 gm. to 3200 gm. The cause of this increase is twofold. First, the increased metabolic activity of the mother furnishes a large source of nutritive substances to the fetus. Second, the adaptation of the placenta to absorb these substances from the decidua of the uterus and transmit them to the fetus is enhanced by anatomical changes occurring within the framework of the placenta. This organ is the important structure in the process of fetal nutrition, carrying the essential nutriments to it, delivering adequate amounts of oxygen so that anoxia will not occur, and carrying away the products of fetal metabolism. The placenta does not store food as did the chorion in the early portion of the pregnancy, but it does produce hormones, enzymes, and other materials necessary for maternal and fetal metabolism. After the placenta is formed, the fetus is able to carry on its own metabolic processes. For instance, the fetal liver now is capable of metabolizing and storing glucose as glycogen (25, 26). It is through such processes, plus dependency on the maternal metabolism, that the fetal growth is accomplished *in utero*.

Microscopic studies of the placenta reveal that certain anatomical changes occur which facilitate the transmission of food across the placental barrier. The syncytial surface, or the outer covering of each chorionic villus, becomes extremely thin, while the capillaries of the villi approach closely the surface of the inner aspect of each villus. This movement of the capillaries toward the outside of the villi is important so that they may come in direct contact with the maternal sinuses, which are filled with maternal blood, containing the necessary ingredients for fetal growth. All of these microscopic changes assure easy transmission of food from the maternal decidua to the fetus and are important factors in its growth and development.

Abnormal Placental Structure

It has been observed that these features do not occur and that there are pathologic changes in the placenta when premature birth is about to occur and when the fetus is congenitally malformed. The abnormal placenta does not produce as much of the hormones, thus affecting not only the maternal metabolism but also the fetal growth. The pathologic changes in the placenta such as the thickening of the syncytial layer, the failure of the capillaries to approach the surface of the villi, and the accumulation of fluid within the villi affect the transmission of materials to and fro through the chorionic walls. Such alterations cause a decrease in maternal metabolism and as a result failure of fetal growth.

DISCUSSION

It has been the purpose of this short resumé to describe in a broad sense the various phases of fetal nutrition while *in utero*. I would like to emphasize that the major factors in this process depend on the formation of a good placenta, which in turn depends on the formation of a satisfactory chorion, which is dependent on the environmental circum-

stances offered by the endometrium or the lining of the uterus at the time of conception. It would seem, then, that prevention of some of the disasters which occur in the development of the total embryonic structure would depend largely on the secretory changes that occur regularly in the endometrium. Analysis of several series of cases seems to bear out this fact. In a series of approximately 14,000 cases, 61 per cent of the complications, such as abortion, premature labor, and congenital malformation, occurred in 24 per cent of the cases. It is evident from such a study that these women had a predisposition towards these complications, and that they were liable to re-occur in subsequent pregnancies. Therefore, it is important that these patients be studied prior to their subsequent pregnancies to correct these deficiencies in local nutrition in the uterus.

This preconceptional study and therapy is concerned with the correction of those factors which may alter the physiology going on in the endometrium during the menstrual cycle. As has been explained previously, certain psychologic aspects of the problem should be corrected, nutritional deficiencies of the patient should be improved, and above all, the secretory activity of the endometrium should be enhanced. All of these factors may have some ultimate influence on the function of this endometrial tissue. More specific endocrine therapy can be directed toward improvement of this process. We have noted that diethylstilbestrol, with or without progesterone, improves the blood flow in the endometrium and thereby increases its metabolic activity. Such therapy also involves metabolism of ascorbic acid and the B vitamins in this structure. Patients treated in this way show a more rapid growth of the chorion because of the increased endometrial function. This can be observed by the fact that the secretion of chorionic gonadotropin by the chorion reaches a higher level than even the normal in some cases.

After conception has occurred, the general nutritional status of the patient is, of course, extremely important. Because of the particular needs of the chorion and the embryo for sugar, the intake of carbohydrate should be increased. It is also important to increase those vitamins involved in the metabolism of sugar, particularly ascorbic acid and the B-complex. There is little, if any, increase in the weight of the patient during this early phase of gestation, so that no restrictions of diet are necessary. However, when we enter Phase III, the intake of food and fluid must be carefully supervised. Excessive weight gain may have a deleterious effect on the patient, causing edema of the pelvic organs which results in more trauma at delivery and is an important factor in the increased incidence of toxemias of pregnancy. Because of the great metabolic change in both the mother and the fetus, diets high in protein and vitamins are desirable.

Also, in view of the tendencies in all patients to retain salt and water, the intake of sodium chloride should be decreased as early as the sixth gestational month. This restriction is extremely important in order to prevent fluid retention, which is destined to occur because of the endocrine changes previously described. In many patients it is difficult to control this retention. If fluid continues to be retained as noted clinically by a sharp rise in weight, other methods of diuresis should be employed. Ammonium chloride, 6 to 8 gm. per day, should be given to create this shift in the acid-base balance of the body and facilitate the excretion of sodium.

If these simple rules in good nutrition will be followed, such complications as the toxemias of pregnancy will be decreased.

Certain types of women, irrespective of attempts on their part to control their diets, will increase weight rapidly. The huge appetite may be produced by the excessive hormonal secretions of the body or by other materials secreted and produced by the placenta. Psychologic difficulties, such as fear of the delivery, also may play a part in this overeating. If the appetite cannot be controlled by serious discussion with the patient and by sincere efforts on her part to decrease the intake, it may be wise to prescribe something which will curb her desires. We have found that dexedrine sulphate, either the slow- or long-acting variety, will accomplish this admirably. Generally, 5 mg. is given 30 min. prior to each meal; or, if the slow-acting variety is prescribed, 15 mg. is given in the morning. We have noticed no harmful effects from such therapy.

If the patient is supervised before pregnancy and certainly after conception by advocating and controlling the diet, it is certain that there will be a decrease in fetal and maternal mortality.

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AUSTRALIAN MEAL PLANNING GUIDE

To supplement the new "Recommended Daily Dietary Allowances" for Australia (see June JOURNAL, page 600), the Nutrition Committee of the Australian National Health and Medical Research Council has also worked out a *Meal Planning Guide*, aimed to express the allowances in terms of foods that make up the Australian diet. It is emphasized that "this list of food groups does not represent absolute good requirements but a practical guide to meal-planning." Daily consumption of one or more items from each group is recommended.

FOOD GROUP*	SUGGESTED AMOUNT	PROVIDES†
Milk. Use milk in any form: fresh, dried, evaporated, in drinks, in cooked dishes, or as cheese.	Children: 1–1½ pt. Adolescents: 1½ pt. Adults: ½ pt. Pregnancy: 1½ pt. Lactation: 1½–2 pt. (20 fluid oz.)	Protein Calcium Vitamins
Meat or other protein food. Red or white meat, poultry, rabbit, fish, eggs, cheese, milk (including dried skim milk)	At least 1 serving, preferably some at each meal	Protein Vitamins Minerals
Vegetables and fruit.	1 serving of potato 3 servings of other vegetables or fruit	Ascorbic acid Other vitamins and minerals Protein
Bread and cereals. Brown or wholemeal bread, white for variety; oatmeal or wheatmeal porridge; flour and other cereal products.	As required	Calories Vitamins Minerals (especially from whole-grain varieties) Protein
Fats. Butter or table margarine	½–1 oz.	Calories Vitamin A
Extra cooking fat	As required	Calories

* In addition to these foods, extra items such as sugar, flavorings, condiments, tea and coffee may be used to add interest and variety to the diet. Sugar, a rich source of calories, provides no protein, vitamins, or minerals.

† Only the main nutrients provided by each group are listed. All foods provide some calories, those specified being the most concentrated sources.

An Anti-Thiamine Effect Produced in Human Subjects by Bracken Ferns[1]

SUKONDHA SAMRUATRUAMPHOL[2] and HELEN T. PARSONS, Ph.D.[3]

Department of Foods and Nutrition, School of Home Economics, University of Wisconsin, Madison

INJURY to animals from the ingestion of bracken ferns (*Pteris aquilina*) was first described in cattle in 1893 (1) and in horses in 1897 (2). It was later established[4] that the body stores and urinary excretion of thiamine were lowered in horses, cattle, sheep, and rats from the destructive effect on food thiamine in the digestive tract by an enzyme, thiaminase, in the bracken fern; however, the degree of the avitaminosis B_1 did not appear to be sufficiently great in the ruminant to account fully for the severity of the condition observed in these animals. Presumably some protection is afforded against avitaminosis B_1 by microbial synthesis of thiamine in the rumen and the toxicity may be chiefly attributable to other antimetabolites in addition to thiaminase in the ferns (6). The effect on domestic animals from bracken poisoning has assumed economic importance in large areas of the world.

Bracken ferns have been accepted as a palatable human food in many countries (7) being consumed both as a salad green and as an asparagus-like vegetable in the fiddlehead or crosier stage. However, folk-lore in Japan has assigned bracken a somewhat dubious nutritional status (8). Inasmuch as previous research had dealt chiefly with tests on animals, the present investigation was undertaken to supplement these by exploring the effect of consuming bracken ferns, selected at palatable immature stages, on the human utilization of thiamine.

EXPERIMENTAL PROCEDURE

Bracken ferns (*Pteris aquilina*) were gathered from three localities within a few miles of Madison during May, June, and July, 1954. For the purpose of analysis, the samples were arbitrarily classified into nine stages of development; in the immature stages (1 to 6) the undeveloped, tightly curled fronds of the crosiers (Stage 1) were gradually unfolding; in the mature, fully expanded fronds, the older ferns of Stage 8 were distinguished from those of Stage 7 by a deeper green color. Stage 9 comprised the dry weathered fronds gathered in May from the previous year's growth. The samples were washed, drained, and held for analysis by freezing which had been found by tests to preserve the thiaminase activity unchanged. Some samples were treated by drying, boiling, or autoclaving in control experiments. For certain samples of the more mature ferns, only the fronds were assayed because of the fibrous nature of the stem.

The ferns ingested by the diet squads were restricted to the delicate, partly curled fronds of Stages 4 and 5; they were either freshly gathered or were held in the refrigerator for not more than a day. The ferns were combined in a salad with tomato and French dressing for each of the three meals. A total of 21 gm. ferns was consumed per day by the members of Squad A and 24 gm. Squad B, the larger amount compensating for a somewhat lower thiaminase content.

Methods of Assay. The fern extract was prepared according to the procedure of Fujiwara and Matui (8). Essentially the method of Melnick *et al.* (9) was used for the assay of anti-thiamine factors in the fern samples, and the shorter method of human bio-

[1] Taken in part from a research report submitted by Sukondha Sumruatruamphol in partial fulfillment of the requirements for the degree of Master of Science, University of Wisconsin, 1954. Supported in part by a fellowship from the American Association of University Women and by Fulbright travel funds. Published with the approval of the Director, Wisconsin Agricultural Experiment Station. Received for publication February 7, 1955.

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[2] Present address: Sukondha Poonpatana, School of Pharmacy, Phya Thai Road, Bangkok, Thailand.

[3] With the technical assistance of Joanne Gilbert. Present address: State Research Hospital, Galesburg, Illinois.

[4] The subject has been well reviewed (3–5).

Luncheon plate and bracken fern-tomato salad for subject of Diet Squad A. This portion of raw fern was consumed three times during the test day.

assay of Melnick *et al.* (10) for availability of dietary thiamine because the supply of freshly gathered ferns would be limited. Thiamine in food samples was assayed by the thiochrome technique using the procedure of the Association of Vitamin Chemists (11).

Subjects. Two diet squads of four subjects each consisted of senior or graduate students from the School of Home Economics. One student of the group was from each of these countries: Thailand, Puerto Rico, India, and the Philippines. The latter student, because of her special interest in the significance of the nutritional problem in her own country, served as a subject on both squads (Subjects 1 and 5, Fig. 2).

Basal Diets. Except for a few individual adjustments in caloric intake, Diet A consisted of the following foods per person per day, expressed in grams: frozen orange juice, 246; hard cooked egg, 108; whole wheat bread, 75; butter, 30; milk, 600; cottage cheese, 100; applesauce, 100; fresh tomato, 150; peanut butter, 16; cubed watermelon, 200; lean pork, 100; converted rice (raw wt.), 37; lettuce, 25; French dressing, 45; ice cream, 100; raisins, 80; and black coffee as desired. The assayed thiamine content was 1.6 mg. The calculated content of protein, calcium, iron, vitamin A, riboflavin, niacin, and ascorbic acid equalled or exceeded the Recommended Dietary Allowances (12).

In Diet B, lean beef replaced the pork of Diet A, reducing the thiamine content to 1.25 mg., more nearly in line with the recommended allowance.

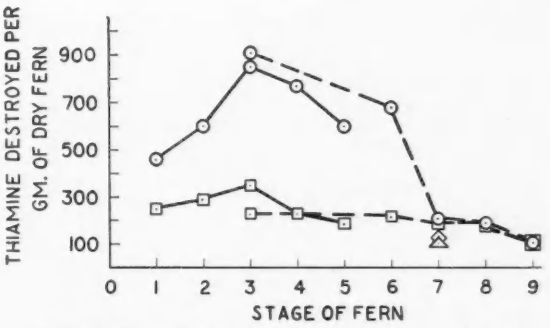

FIG. 1. *Changes in the activity, per dry gram of fern, of a heat-labile* ⊙———⊙— — —⊙ *and a heat-stable* ⊡———⊡— — —⊡ *anti-thiamine factor in respect to differences in maturity and treatment of the ferns.* ——— *indicates tests on the whole fern;* — — — *tests on the fronds only. Stages 1 to 6, immature ferns with curled fronds; Stages 7 and 8, two mature stages; Stage 9, weathered ferns;* ◈ *thermo-labile and* ◬ *thermo-stable factors in air-dried ferns, Stage 7.*

RESULTS

Anti-Thiamine Factor in Bracken Ferns

Two types of anti-thiamine factors—one, heat-labile, the other, heat-stable—were found in the bracken fern in both stems and fronds at all stages of maturity, thus confirming and extending the observations of Fujiwara and Matui (8). The relative proportions between the two types were determined in the various samples of ferns without attempting adjustment to optimum *p*H. The thiaminase, equally labile to boiling for 20 min. and to heating at 15 lb. pressure, varied in respect to the maturity of the plant. Figure 1 shows that the concentration of this anti-thiamine factor was greatest[5] at Stage 3 at which time the frond was still small and only partly unfolded; the more immature Stages 1 and 2 were measurably less rich in thiaminase, and the more mature stages showed a progressive decline in enzyme concentration. Air-drying of the fronds of Stage 7 led to a loss of nearly half their potency and evidently constituted the chief cause of the relatively low value in the old weathered fronds (Stage 9).

In comparison with thiaminase, the concentration of the heat-stable factor(s) showed less fluctuation in respect to maturity and condition (*Fig.* 1). The identity of the heat-stable factor is not known. Fujiwara and Matui (8) have reported that heat-stable, anti-thiamine factors are of wide distribution in plants and are resistant to drying, probably of small molecular weight, not enzymes, and active optimally at *p*H 8. Ågren states (13, 14) that this group of factors may be antagonists only in regard

[5] Since the fiber content changed with growth, this peak fell at Stage 4, when calculation was based on the moist weight.

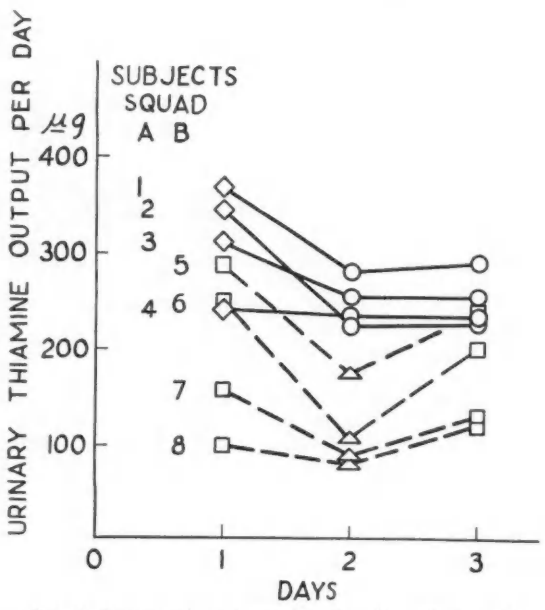

FIG. 2. *Decrease in urinary thiamine from the ingestion of bracken fern fronds supplementing a quantitative basal diet. Squad A (Subjects 1 to 4): ◈ indicates excretion on Day 1 on Basal Diet A alone; ⊙ on fern supplements (21 gm.) on Days 2 and 3. Squad B (Subjects 5 to 8): ⊡ excretion on Basal Diet B alone on Days 1 and 3; △ on fern supplements (24 gm.) on Day 2.*

to the measurement of thiamine by certain chemical assay methods, but not in any nutritional or metabolic sense.

Availability of Thiamine to Human Subjects

In seven of the eight subjects studied, the urinary thiamine decreased, measurably, from the output established on the basal diet alone, to a lower urinary value when 21 or 24 gm. of fresh bracken fern fronds were added to the basal diet (*Fig.* 2). In Squad A, a second day of fern intake gave the same reduced level of output as the first, showing that the average decline for the group from an excretion of 316 mcg. to 250 mcg. was a real effect of the fern intake. In Squad B, on a somewhat less rich basal diet, the average thiamine output on the test day fell from the basal level of 198 mcg. to 113. When the basal diet alone was resumed on the third day, the thiamine output again increased, although a "lag" effect of the fern intake was apparent. A comparison of the anti-thiamine effect on urinary output in the present experiment with that in the study of Melnick *et al.* (9) shows that 21 to 24 gm. fresh bracken fern fronds produced about the same average decline in the thiamine excretion of the Wisconsin subjects as did 100 gm. raw clam tissue in Melnick's study.

Although the present results give satisfactory evidence of an anti-thiamine effect from bracken, there was more variation among the values for the different subjects than has been true in the use of this method in this laboratory in the past. The thiamine "returns" for Subjects 1 to 8 on the basal diets alone were, respectively, 23, 21, 19, 15, 24, 21, 13, and 8 per cent, a wider range than expected. The shortness of the time during which some of the subjects were available for the study forced the omission of the usual preliminary controlled period of thiamine storage; when the urinary collections on the self-chosen customary diets procured before the experiment were assayed later, they revealed that Subjects 4, 7, and 8 had excreted 117, 112, and 91 mcg. thiamine on that day. These values were less than the amount to be expected had the recommended allowance of thiamine been consumed by these subjects customarily. In contrast, the student who served on both squads (as Subjects 1 and 5) put out 216 and 234 mcg. thiamine on her two "customary diet" collection days which correlated excellently with her high "returns" on basal days and the pronounced drop in excretion on the days when ferns were eaten. It is evident that the low body stores of Subjects 4, 7, and 8 led to an undue retention of the food thiamine on the standard basal day, thus masking the full lowering effect of the fern intake on the succeeding day.

From the present *in vitro* results, it is apparent that cooking will destroy the thiaminase in bracken fern fiddlehead and fronds. On the other hand, the persistent use of raw bracken greens as a human food would appear capable of exerting a deleterious effect on the normal storage of thiamine in body tissues. The prevalence of symptoms suggestive of avitaminosis B_1 during World War II in Oriental prisons and internment camps has not been satisfactorily explained in view of the relative absence of these in Europe; a toxic factor, possibly an antivitamin in the diet, has been suggested (15). In America, in some regions where garden vegetables are scarce because the growing season is short, wild greens including ferns are sometimes extensively eaten (7, 16); it is possible that there is a real need to use discretion in selection among those available or in the method of their preparation for the table.

An increased use of raw ferns in the diet has occasionally been recommended (7, 17, 18).[6] Fernald and Kinsey (18) have stated that only when the bracken fronds are fully grown and tough do they develop the toxic principles which sometimes poison grazing animals. They conclude that the unappetizing quality of old, dry, and hard pasture-brake would suffi-

[6] Since this paper was submitted for publication, the authors have learned that in the March 1955 issue of *Boy's Life*, official publication of the Boy Scouts of America, "pasture brake or bracken" is recommended as "delicious when fresh." Directions for cooking are given, as well as the suggestion that it may be eaten raw or in a salad.

ciently protect human beings from harm through the use of bracken ferns in the diet, a conclusion not in accord with the results of the present experiment, inasmuch as the presence of anti-thiamine factors in tender young fronds were demonstrated by both *in vitro* and *in vivo* tests.

SUMMARY

In agreement with reports of others, two types of anti-thiamine factors were found to be present in bracken ferns (*Pteris aquilina*). The heat-stable factor, the identity of which is unknown, showed relatively little variation in regard to the maturity or condition of the ferns. The heat-labile factor, a thiaminase, increased in concentration as the fern crosiers began unfolding, then decreased through subsequent maturing stages of the fern and during drying and weathering.

The urinary thiamine excretions of eight subjects were determined on a standard basal diet; seven subjects subsequently showed a lowered thiamine output when raw bracken fern fronds were consumed as a salad in addition to the diet. It appears that the presence of ferns in the diet decreased the availability of the food thiamine, presumably by splitting it into fragments not used as thiamine by human subjects, as has previously been shown to be true in the case of four types of animals.

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Riboflavin in Enriched Bread Saved by Opaque Waxed Paper

Opaque waxed paper is about twice as effective in reducing loss by light of riboflavin in enriched bread as is Cellophane, according to a report given before the Institute of Food Technologists in Columbus in June.

W. H. Kanninen, Director of Food Technology, Foster D. Snell, Inc., New York City, reported on laboratory studies which showed that enriched white bread wrapped in opaque waxed paper retained 30 to 60 per cent more riboflavin than bread wrapped in Cellophane after maximum probable exposure to diffuse daylight and/or fluorescent light under normal conditions of commerical distribution.

A commercial baker baked 120 loaves of white enriched bread and, using commercial wrapping equipment, wrapped part with opaque waxed paper and another part with clear Cellophane. Samples were exposed to diffuse daylight or fluorescent light for from one to five days for 12 hr. a day. Samples were also kept in total darkness for control purposes.

Analysis of the bread for riboflavin content after the experiment indicated that waxed-paper wrapped bread retained 70 to 85 per cent of the initial riboflavin content, while that wrapped in Cellophane only 45 to 65 per cent. Further exposure tests on riboflavin solutions in wrapped glass tubes confirmed these results. After exposure to daylight and fluorescent light, twice as much riboflavin had been destroyed in the tube wrapped in Cellophane.

Food Habits of Children[1]

MARTHA POTGIETER, Ph.D., and ELLEN H. MORSE[2]

School of Home Economics and Storrs Agricultural Experiment Station, University of Connecticut, Storrs

RECORDS of food intake of 1242 Connecticut school children provide the basis for the present study. The levels of intake of the Basic 7 food groups are noted for city and rural children, for boys and girls, and for the various age levels.

In a preliminary study of 385 children (1), a relationship was noted between quality of the diet and dental status. In the larger group of children, a more careful dental examination was made. A report of the dental status and food habits will be published elsewhere (2).

PROCEDURE

Cooperating Schools. A seven-day study of food intake was made in nineteen schools in eastern Connecticut, in grades five through eight, in the spring of 1950. Seven-day records were completed by 864 of the children (386 boys and 478 girls). An additional 378 children, making a total of 1,242, completed records for four, five, or six days. Of the 1,242 children, 465 attended three elementary schools in a city of 15,000 population. These children are designated as "city" children, in contrast to the other 777 children who attended small village or rural schools and who are designated as "rural" children. Of the 864 children with seven-day records, 368 were city children and 496 were rural children.

Collecting the Data. Each child was asked to keep a record for seven consecutive days of all foods eaten each day. The form used in keeping these daily records called for the name of each food or drink eaten at each of the three meals and the number of servings of each. To minimize the influence of the record-keeping on food intake, no attempt was made to have the children record specific sizes of servings. The record sheets also provided spaces for food and drink consumed between meals, for any vitamin supplements taken, and for source of lunch eaten on school days. At the top of each sheet the child recorded age, sex, grade, name and location of school, name of teacher, and date. A line in the upper right corner was used for the child's name, or a self-chosen number if the child preferred to remain anonymous.

The senior author explained the procedure of the study to the teachers and children in each school and gave some assistance to the teachers in the supervision of the children's daily diet records. The study was begun on a Monday or Tuesday so that the children would learn to keep the records without help by the end of the week. Records were begun at least one week after Easter in order to avoid the influence of Lent on intake.

Scoring and Rating the Diets. In scoring the diets for relative nutritional quality, the National Food Guide (3) served as a standard. For this study, four glasses of milk per child were considered essential for an "optimal" diet. Additional servings of any group were not accepted in lieu of shortages in other groups the same day, or for lacks in the same group on other days.

The diets were rated according to high, middle, and low. Those in the "high" group had average daily scores ranging from 9.0 to 13 points, inclusive; that is, each child averaged 9.0 to 13 servings of the recommended Basic 7 foods per day. Diets in the "middle" group scored an average of 7.0 to 8.9 points, inclusive, per day; those in the "low" group, 3.0 to 6.9 points. The purpose of the division at these points was to avoid too large or too small a number in each group.

FINDINGS

Relative Quality of the Diets

City vs. Rural Children. The scores of the rural children, on the whole, averaged slightly higher than those of the city children. Of the 864 children with seven daily food intake records, 25 per cent of the city children and 54 per cent of the rural children

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[2] The authors acknowledge with thanks the help of Marie Gabriel and Marilyn Oberle, graduate assistants in foods and nutrition, in calculating and tabulating the dietary record sheets. Credit and appreciation are due also to the children who participated in the study and to the teachers who supervised the keeping of the dietary records.

had diets in the high range. The diets of 33 per cent of the city children and 13 per cent of the rural students were rated in the lowest range. Considering the entire group of 1,242 children, with four to seven daily food intake records, the distribution among the three classes of ratings was quite similar to that in the smaller group. The former group might be considered to give more reliable information on food habits than the latter.

Boys' vs. Girls' Diets. The food habits of the girls were slightly better than those of the boys. Among the girls, a slightly higher percentage rated "high" and a smaller percentage were in the "low" rating, as compared with the distribution of the boys.

Comparison of Diets at Various Ages. Considering boys and girls as one group, there was noted a tendency, with increasing age, for a smaller percentage of the children to be in the "high" group and progressively more in the "low" group. The deterioration of diets with increasing age was a little more marked among the girls than the boys. This slight tendency of the diets to grow worse with increasing age does not, however, forecast any marked shift to poor eating habits, such as have been reported for high school students, especially girls (4–6).

Intake of Specific Food Groups. The foods most often lacking in all three of the groups were green and yellow vegetables and ascorbic acid-rich foods (Table 1). These shortages were more marked in the diets of the city children than in those of the rural pupils. Intake of other vegetables and fruits by both city and rural children in the "high" and "middle" groups met the standard; both the city and rural children with diets rated "low," however, did not receive the recommended intake of two servings a day.

The average daily milk intake by both city and rural children in the "high" group was more than 4 cups a day. In the "middle" group, the city children averaged 3.50 and the rural children 3.16 cups daily. In the "low" group, the city children had an average of slightly over and the rural children slightly under 2 cups per day. The average daily milk intake of all the 777 rural children was 3.57 cups; of all the 465 city children, 3.32 cups per day. The average for all children was 3.48 cups.

In the protein food group of meat, poultry, fish, eggs, dried legumes, and nuts, both the city and rural children in all three groups had a total average daily intake of over two servings. Intakes by city and rural children were quite similar.

In the food groups of bread, flour, and cereals and of butter and fortified margarine, the diets of both city and rural children in all three groups met the standard for the recommended number of servings per child per day. The intake of whole-grain cereals and breads was very low. However, much of the flour, bread, and rolls sold in Connecticut is enriched, although enrichment is not mandatory.

Between-Meal Eating and Meals Missed

Between-meal eating occurred more frequently among the children in the "high" and "middle" groups than in the "low" group. There was no difference between city and rural children in the extent of between-meal eating. Snacks were reported by 97 per cent. About 10 per cent reported as many as two or more snacks a day. These included milk, ice cream, fruits, soft drinks, candy, and other refined sweets. The daily intake of candy and soft drinks averaged slightly less than one serving a day among the country children and slightly more than that with the city children. The highest intake of such refined carbohydrates was among the city children rated in the "low" group.

The number of meals missed by these children was rather low, only 10 per cent of the total reporting that this occurred. The number ranged from an average of about one a week for both city and rural children in the "low" group to about one in six weeks for all children in the "high" group. The average number of meals missed for the whole group was only 0.39 per child per week.

TABLE 1

Average servings of food groups consumed per child per day, according to rating of diet

FOOD GROUP	RECOMMENDED SERVINGS	AVERAGE SERVINGS							
		"High" group		"Middle" group		"Low" group		All groups	
		City children	Rural children	City children	Rural children	City children	Rural children	City children	Rural children
Leafy, green, and yellow vegetables	1	0.87	1.11	0.62	0.71	0.36	0.51	0.58	0.88
Citrus fruit, tomatoes, raw cabbage, etc.	1	0.94	0.87	0.55	0.54	0.30	0.39	0.57	0.68
Other fruits and vegetables, including potatoes	2	2.52	2.65	2.02	2.03	1.58	1.63	2.01	2.28
Milk, cheese, and ice cream (as cups of milk or equivalent)	4	4.52	4.38	3.50	3.16	2.14	1.85	3.32*	3.57*
Meat, poultry, fish, eggs, dried legumes, and nuts	2	2.70	2.57	2.52	2.34	2.20	2.16	2.46	2.44

* This difference in milk intake by city and rural children, in the individual groups as compared with that in the group as a whole, is due to the unequal distribution of city and rural children among the three groups.

Some relationship was noted between grade level and number of meals missed by rural children. Those in the eighth grade missed an average of 0.7 meals per child per week, while those in each of the other three grades missed about 0.3 meals. The city children, at each of the four grade levels, missed about 0.4 meals per child per week. Breakfast represented 55 per cent of the meals missed by the rural eighth graders; 20 per cent were noon meals; and 25 per cent were evening meals. When the average number of meals missed by all the boys was compared with that of all the girls, no difference was noted.

SUMMARY

Food intake records for periods of four to seven days of 1,242 Connecticut school children in grades five to eight, inclusive, indicate the following:

The diets of the 777 rural children scored slightly higher than those of the 465 city children, particularly in fruits and vegetables.

The diets of the girls were somewhat better than those of the boys.

The eleven-year-old children had slightly better diets than those from twelve to fourteen years. This was more marked among the girls than among the boys.

The foods most often lacking in the diets were green and yellow vegetables and the ascorbic acid-rich foods.

The average daily milk consumption by the whole group was 3.48 cups (or equivalent) per day. Consumption of protein foods, by all the groups, averaged slightly over two servings a day.

Eating between meals was reported by 97 per cent of the children; about 10 per cent reported an average of two or more snacks per day.

Only 10 per cent of these children reported any meals missed.

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Old vs. Young Workers

A "balance sheet" comparing the physical and mental abilities of youth and age has been drawn up by the International Labor Organization of the United Nations, in a report titled "The Employment of Older Women Workers." Despite the title, the "profit and loss" tabulation applies to both sexes.

It shows that in quantity, at least, the good characteristics acquired or augmented in later life equal or surpass those of youth. As to quality, that is an open question which everyone must decide for himself.

On the debit side of the ledger, the greatest losses with age are those on the physical or "psychomotor" level. Decreased flexibility, robustness, manual strength, and precision speed are offset only by a gain in "regularity" of behavior.

In the "moral" category, however, the positions are reversed. No losses appear, and gains are seen in punctuality, appreciation of finished work, and care over detail.

On the "intellectual" level, such qualities as memory, imagination, creative spirit, and adaptability are expected to deteriorate, against increases in concentration, caution, and methodical habits.

Finally, as far as "character" is concerned, decreased sociability, initiative, diligence, energy, and vitality are on the losses side of the ledger, compared with increased willingness, patience, discipline, prudence, reliability, and stability on the credit side.

The report concludes that "in terms of occupational activity (aging) tends to enable the individual partly to compensate for his deficiencies by a change in method. Furthermore, a slackening of speed in the performance of certain work is not only not general among all older women workers, but is frequently more than made up for by improvements in the quality and precision of work done." It adds that "while skilled and experienced male workers have some prospect of promotion, the prospects for women workers are usually more restricted. As a consequence, women workers have fewer opportunities of applying the qualities characteristic of middle age in an occupation."

The report is based on studies conducted by the Societe Francaise de Psychotechnique and the Nuffield Foundation of the United Kingdom.

Assessment of Dietary Study Methods

II. Variability of Eating Practices and Determination of Sample Size and Duration of Dietary Surveys[1]

MARTHA F. TRULSON, D.Sc.

Department of Nutrition, Harvard School of Public Health, Boston

THIS study of seven-day dietary records was undertaken to provide more information about the variability of eating practices. From these data the variability of the individual can be determined and information as to size of sample and length of study can be investigated. The surveys were conducted for two purposes: to contribute to the dietary studies of the relationship of diet to rheumatic fever and to study methodology of conducting dietary surveys.

Two schools in Chicago were selected for the study: the Laboratory School of the University of Chicago and the Haines Public School. These schools were similar in enrollment and both were in congested areas of the city. However, the population of the Laboratory School came mainly from the upper middle class with distinct social and economic advantages, whereas the Haines School population was principally Negro and from a less favored economic group. Though the total school population was surveyed, this report will be limited to data from an initial survey of pupils ranging in age between ten and twelve years and a resurvey of seventy pupils of the Laboratory School.

The first survey was done in December 1949 in the Laboratory School with 132 children, ages ten to twelve, participating. During January 1950, 120 children of the same age group participated in the Haines study. In February 1951, seventy children from the Laboratory School were resurveyed. Both boys and girls participated, the proportion being approximately the same in both groups.

Booklets were distributed through the classroom teachers. Directions were given by the teacher and were also included in the booklet. Survey 1 started on Monday in the Laboratory School, while Sunday was the first day in the Haines School. In the resurvey of the former school, Wednesday was the starting day. The method of tabulation for the entire survey was described previously (1).

In this paper one food, milk (including milk products), and two nutrients, total protein and vitamin A (including carotene), are discussed. Correlation coefficients for each day with every other day were done, making a total of forty-two correlations for each of the three items. Means, standard deviations, and coefficients of variation are also listed for each day of the week. For Survey 1 in the Laboratory School, in addition to the daily means and standard deviations, averages of intakes of these nutrients for three days, Tuesday, Wednesday, and Thursday, and for the seven-day period were made. Individual records were pulled at random from the groups, and means and standard deviations were computed on a day-to-day basis. For conservation of space, tables of day-to-day correlations are omitted and only the average correlations given.

FINDINGS

Tables 1 and 2 are examples of how the data were tabulated. The mean values for protein, milk, and vitamin A intakes appear in Table 3.

Laboratory School, Survey 1

Correlation coefficients of protein intake on different days for the Laboratory School children of the first survey ranged from 0.17 to 0.47. The three highest correlations were between Wednesday-Thursday, Monday-Tuesday, and Thursday-Friday. The three lowest were Monday-Saturday, Monday-Sunday, and Thursday-Saturday. The average correlation coefficient was 0.36, with the average for each daily combination ranging from 0.31 to 0.47 (Table 1). Correlation coefficients were grouped and averaged for the number of days apart. There was a gradual decrease in the average correlation coefficients as the days apart increased, being 0.44 for one day apart and 0.26 for six (Table 2).

[1] Supported in part by grants-in-aid from the Kellogg Company, Sugar Research Foundation, and the J. M. Kaplan Fund, Inc. Data used in this paper were obtained while the author was Research Associate, Rheumatic Fever Research Institute, Northwestern University Medical School, Chicago. Received for publication May 24, 1954.

TABLE 1

Correlation coefficient showing variability of intake

SURVEY	PROTEIN			MILK			VITAMIN A		
	Average correlation*	Range†	Average daily combination‡	Average correlation*	Range†	Average daily combination†	Average correlation*	Range†	Average daily combination‡
Laboratory School, Survey 1	0.36	0.17–0.47	0.31–0.47	0.47	0.28–0.69	0.40–0.52	0.16	0.03–0.32	0.12–0.21
Haines School	0.35	0.17–0.49	0.26–0.40	0.35	0.21–0.49	0.31–0.39	0.13	0.01–0.45	0.08–0.25
Laboratory School, Survey 2	0.47	0.32–0.70	0.39–0.51	0.44	0.24–0.66	0.35–0.51	0.23	0.01–0.49	0.11–0.32

* Each day with each other day (21 correlations).

† Highest and lowest of the 21 correlations.

‡ Average of 7 combinations.

TABLE 2

Correlation coefficients of intake with distances of days apart from one to six days

DAYS APART	AVERAGE CORRELATION COEFFICIENTS		
	Protein	Milk	Vitamin A (including carotene)
Laboratory School, Survey 1, 1949*			
1	0.44	0.52	0.19
2	0.35	0.48	0.18
3	0.34	0.46	0.12
4	0.35	0.46	0.16
5	0.27	0.44	0.12
6	0.26	0.28	0.12
Haines Public School†			
1	0.42	0.43	0.20
2	0.35	0.38	0.12
3	0.33	0.31	0.06
4	0.29	0.28	0.19
5	0.28	0.25	0.04
6	0.29	0.37	0.02
Laboratory School, Survey 2, 1951‡			
1	0.48	0.47	0.25
2	0.44	0.41	0.17
3	0.47	0.44	0.21
4	0.45	0.38	0.23
5	0.51	0.47	0.28
6	0.51	0.54	0.44

* 132 children, ages 10 to 12. First day of survey was Monday. Correlation coefficients greater than 0.22 are significant.

† 120 children, ages 10 to 12. First day of survey was Sunday. Correlation coefficients greater than 0.23 are significant.

‡ 70 children from Survey 1. First day of survey was Wednesday. Correlation coefficients greater than 0.30 are significant.

The lowest mean protein intake was on Friday. This differed significantly from that of Monday. There was a 6 per cent difference between the lowest and highest coefficients of variation.

Correlation coefficients for milk intakes were all significant, ranging from 0.28 to 0.69 (Table 1). The three highest were between Thursday-Friday, Wednesday-Thursday, and Wednesday-Friday. Lowest correlations occurred on Sunday-Monday, Friday-Saturday, and Thursday-Saturday. The average correlation was 0.47, with the average of each daily combination ranging from 0.40 to 0.52. As with protein intake, there was a gradual decrease in average correlation coefficients for the milk intake as the days apart increased (Table 2). There was a correlation coefficient of 0.52 when the correlations were one day apart. This decreased to 0.28 at six days apart. Table 3 shows the trend for daily decrease in the values for mean intake. There were significant differences in the mean intakes for the first and last two days of the study. Difference between the lowest and highest coefficients of variations was 7 per cent.

Vitamin A showed poor correlation, with day-to-day variation ranging from 0.03 to 0.32, and an average correlation coefficient from 0.12 to 0.21 with a mean average of 0.16 (Table 1). From Table 2 it is seen that as days apart increased, the data showed a tendency toward no correlation, being 0.19 for the one-day-apart average and 0.12 for an average of six days apart. Table 3 shows a gradual decrease in mean intake with the exception of Thursday. There was variability in standard deviations, and the coefficients of variations ranged from 81 to 118 per cent.

Haines School

With the data from the 120 pupils of the Haines School, the correlations for protein intake ranged from 0.17 to 0.49, correlation coefficients greater than 0.23 being significant (Table 1). Twenty of the day-to-day correlations were significant. The highest correlations were Tuesday-Wednesday, Thursday-Friday, and Wednesday-Thursday, while the lowest were Sunday-Tuesday, Sunday-Thursday, and Sunday-Wednesday. The average correlation coefficient was 0.35, with the average of each daily combination ranging from 0.26 to 0.40. While there was a trend for the correlation to decrease as the days separating the two correlated days increased, it was not as apparent as in the Laboratory School group. The daily mean intakes are shown in Table 3. There was a noticeable drop in mean intake as the survey progressed, and the mean values between the first days of the survey and the latter days showed

TABLE 3

Average daily intakes of protein, milk, and vitamin A (including carotene)

DAY	PROTEIN			MILK			VITAMIN A (including carotene)		
	Mean intake	Standard deviation	Coefficient of variation	Mean intake	Standard deviation	Coefficient of variation	Mean intake	Standard deviation	Coefficient of variation
	Laboratory School, Survey 1								
	gm./day	*gm./day*	*%*	*cups/day*	*cups/day*	*%*	*I.U./day*	*I.U./day*	*%*
Monday	68	21.65	31.5	3.7	1.77	48.1	5820	5940	102.1
Tuesday	66	18.60	27.7	3.5	1.56	44.3	5710	4640	81.2
Wednesday	65	19.00	28.8	3.5	1.76	50.2	5450	5840	107.1
Thursday	64	19.15	29.7	3.5	1.63	46.2	4650	4730	101.7
Friday	62	19.85	31.6	3.3	1.70	51.4	4800	4710	98.0
Saturday	65	19.90	30.4	3.2	1.61	50.2	4330	4110	94.9
Sunday	65	21.85	33.4	3.2	1.60	49.6	5330	5110	118.1
	Haines Public School								
Sunday	50	24.80	49.4	2.1	1.35	63.9	2558	2470	96.5
Monday	50	22.05	43.9	2.6	1.43	56.0	2613	3190	122.0
Tuesday	48	19.33	39.5	2.4	1.37	58.2	3471	4520	130.2
Wednesday	44	10.20	42.9	2.2	1.43	65.5	2917	1890	64.7
Thursday	44	20.20	45.8	2.1	1.31	62.3	2400	2630	109.5
Friday	41	18.85	45.0	2.1	1.20	56.0	2446	2960	121.0
Saturday	40	21.55	53.8	2.7	1.20	43.7	2763	3480	125.9
	Laboratory School, Survey 2								
Wednesday	75	21.05	28.1	3.4	1.72	50.4	5143	4830	93.9
Thursday	67	18.65	27.8	3.2	1.46	45.6	6464	7740	119.7
Friday	71	20.65	29.2	3.1	1.58	50.6	3850	3700	96.1
Saturday	79	21.05	32.9	3.5	1.71	49.2	5021	5290	105.3
Sunday	66	21.35	32.3	3.3	1.55	46.9	4129	4350	105.3
Monday	71	21.65	30.5	3.4	1.72	50.4	6807	7380	108.4
Tuesday	69	20.76	30.0	3.3	1.59	47.6	5636	5550	98.4

significant differences. The coefficients of variations showed differences as great as 14.3 points.

Correlations for milk intake in the Haines children ranged from 0.21 to 0.49 (Table 1). All but two were significant: Friday-Sunday and Friday-Tuesday. The three highest correlations were Monday-Wednesday, Monday-Tuesday, and Friday-Thursday; with the three lowest appearing between Friday-Tuesday, Friday-Sunday, and Saturday-Tuesday. The average correlation was 0.35 with daily averages ranging from 0.31 to 0.39. The averages obtained by the days apart (Table 2) decreased as the length of time increased until Saturday, the last day of the survey, which, when correlated with Sunday six days before, was 0.37, showing a break in the pattern. In Table 3, showing the means of the milk intake, it was evident that no pattern can be described. There were significant differences in the means. The last day of the survey had the largest milk consumption. The coefficients of variation ranged from 43.7 to 65.5 per cent.

Correlation coefficients for the vitamin A intakes of the Haines children ranged from 0.01 to 0.45 (Table 1). Only five correlations have any significance. Daily averages ranged from 0.08 to 0.25. Daily averages of Thursday (Thursday correlated with each other day of the week) were exceptionally high, which cannot be explained. The average correlation for the days apart revealed no apparent pattern. There appeared to be no particular differences in the means (Table 3). The coefficients of variation showed great differences, the lowest being 64.7 per cent and the highest 130.2.

Laboratory School, Survey 2

A second survey was done in February 1951 at the Laboratory School. Seventy of the children in the first survey again returned records. The data are given in Tables 1, 2, and 3. The correlations for protein intakes were generally higher than for the initial survey in 1949, and all were significant. They ranged from 0.32 to 0.70 (Table 1), with Monday-Thursday being the highest, and Monday-Friday and Monday-Wednesday following. The poorest correlations were for Wednesday-Sunday, Thursday-Sunday, and Tuesday-Friday. The average correlation coefficient was 0.47, with the daily average ranging from 0.39 to 0.51. There was no observation of a gradual decrease in average correlation as days apart increased. In fact, five days apart and six days apart yielded the highest correlation coefficients.

Table 3 shows mean daily protein intake. In some instances there were significant differences in mean values. The over-all mean value for seven

days in Survey 2 was 69.9 or 4.2 gm. higher than that of the first study. Standard deviations were correlated with the first study, but no gradual decrease in the means was noted.

Day-to-day correlations of milk intake ranged from 0.24 to 0.66, the highest being Monday-Tuesday, Monday-Thursday, and Wednesday-Thursday. The lowest correlations were Tuesday-Friday and Wednesday-Sunday. The average correlation approximated that of the former survey and daily averages ranged from 0.35 to 0.51. The average correlations according to days apart followed the pattern of protein (Table 2), with the two highest correlations one, five, and six days apart. Mean intakes of milk were about the same for both surveys, and the means did not differ significantly (Table 3). Standard deviations appeared to be of the same magnitude, with a difference of 4.81 between the lowest and highest coefficient of variation.

Vitamin A correlations as usual were variable and generally low, ranging from 0.01 to 0.49; only six were significant. Daily averages ranged from 0.11–0.32. When the correlations were five and six days apart, the highest figures were noted. Comparison of the means showed statistical differences. The means for the second study were slightly higher than for the first. Coefficients of variation were very high as in the first study.

TABLE 4

*Intake of protein and milk for individual children (six for each food or nutrient)**

INDIVIDUAL	MEAN INTAKE	STANDARD DEVIATION	COEFFICIENT OF VARIATION
	Protein		
	gm.	*gm.*	*%*
1	62.1	8.61	13.8
2	61.4	16.97	27.6
3	71.4	12.15	17.0
4	61.4	6.39	11.2
5	59.2	16.91	28.5
6	51.4	9.87	19.1
	Milk		
	cups	*cups*	
7	3.7	1.66	43.9
8	3.4	1.09	31.7
9	3.7	0.95	25.0
10	2.7	0.76	28.0
11	2.6	0.57	21.5
12	1.2	0.95	73.8
	Vitamin A		
	I.U.	*I.U.*	
13	1,557	690	44.3
14	3,586	4,428	123.4
15	12,500	10,087	80.7
16	3,214	486	15.1
17	7,943	10,498	130.6
18	6,943	6,502	93.6

* Laboratory School, Survey 1.

INTAKES OF 18 CHILDREN SELECTED AT RANDOM

The variations of eighteen children, six each for the three components, milk, protein, and vitamin A, can be seen in Table 4. These children were selected at random from the first Laboratory School study. The coefficients of variation showed the differences from day to day for the individual child. These differences were smallest in protein and largest in vitamin A.

SEVEN- AND THREE-DAY INTAKES

The mean intakes, standard deviations, and coefficients of variations for the averages of the seven-day and the three-day (Tuesday, Wednesday, and Thursday) studies during Laboratory School Survey 1 are given in Table 5. The standard deviations and coefficients of variation decreased with the increase in the length of the survey from one to seven days.

DISCUSSION

An analysis of the data obtained from these three surveys reveals some consistencies and some inconsistencies. The 1950 survey of Haines School children ages ten to twelve and the first survey (1949) of the Laboratory School children of the same ages showed a gradual decrease in mean values of protein as the study progressed. Correlation coefficients, all of which were significant, decreased as days apart increased. This pattern was not repeated in Survey 2, carried out in 1951 on children who had participated in Survey 1. Milk and protein intakes in 1949 showed the same picture, but this was not so for the studies in the Haines School or the second survey (1951) of the Laboratory School children. In all of these

TABLE 5

Comparison of intake of protein, milk, and vitamin A for seven days, three days, and one day

LENGTH OF STUDY	MEAN INTAKE	STANDARD DEVIATION	COEFFICIENT OF VARIATION
	Protein		
	gm.	*gm.*	*gm.*
7 days	65.6	13.40	20.4
3 days†	65.9	14.90	22.5
1 day‡	65.0	19.00	28.6
	Milk		
	cups	*cups*	
7 days	3.4	1.17	34.1
3 days†	3.5	3.5	38.5
1 day‡	3.5	1.76	50.2
	Vitamin A		
	I.U.	*I.U.*	
7 days	5129	3083	60.1
3 days†	5273	3729	70.7
1 day‡	5450	5840	107.1

* Laboratory School, Survey 1.

† Tuesday, Wednesday, and Thursday

‡ Wednesday

studies, correlation coefficients for milk were significant, but they followed no definite pattern. Some were highest for certain days, others for other days, some when averaged for one day apart, others for six days apart.

The correlations for vitamin A were generally low, average correlation coefficients showing no significance in all the studies.

The first day of the surveys was changed for each study. There was no evidence that the day selected for starting a study influenced the food intake. Also, the study presented no indication of a consistently high or low intake of certain types of foods or nutrients on any particular day of the week.

Realizing the great variability of the means from day to day or from child to child, it is of practical interest to reduce the data to definite figures. A daily average was obtained, first basing the average on the seven-day record, then basing it on the three days, Tuesday, Wednesday, and Thursday. In Survey 1 at the Laboratory School, the mean protein intake based on *three* days was 65.9 gm., with a standard deviation of 14.9. The coefficient of variation was 7 to 8 points less than that observed on any single day. The mean protein intake (Survey 1) based on *seven* days was 65.6 gm. ± 13.4, with a coefficient of variation 9 to 10 points less than that observed on any single day. The three-day mean value for milk was 3.5 cups ± 1.37, with a coefficient of variation 6 to 13 points less than on any one day, while the seven-day mean was 3.4 cups ± 1.17 with a coefficient of variation 10 to 17 points less than on any one day. The three-day mean value for carotene and vitamin A intake was 5273 I.U. ± 3729, with a coefficient of variation 10 to 47 points less than on any one day; the seven-day mean value was 5129 I. U. ± 3087, with a coefficient of variation 20 to 57 points less than on any one day.

Thus, the value of a three-day study over a one-day study is evidenced by the reduction of the standard deviation. With less variation within the sample, the means became more stable. Lengthening the study to seven days further reduced the standard deviation. The extent to which this was reduced depended on the nutrient or food under investigation. For example, lengthening the survey of 132 school children from three to seven days reduced the standard deviation 10 per cent for protein, 15 per cent for milk, and 17 per cent for carotene and vitamin A.

This information indicates that the length of the study should be determined by the nutrients or foods to be investigated. The interpretation of any survey depends on a comparison with established recommendations, or with a survey made on a similar group or on the same group. The sizes of the sample suitable for comparison must be determined.

To determine sample size necessary to establish 10 per cent of the mean as a significant difference, when two surveys were being compared, the following formula was used:

$$\frac{10 \text{ per cent of the mean}}{\sqrt{\frac{(\text{S.D.})^2}{N} + \frac{(\text{S.D.})^2}{N}}} = 2$$

N represents the number of records in the surveys; S.D. is the standard deviation. It is seen that the sample size varies inversely with the square of the established significant difference. The means were determined from Survey 1 of Laboratory School children for protein, milk, and vitamin A (including carotene). The standard deviations of one day, three days, and seven days were inserted into the formula. It was found that for protein, two samples of 74 one-day records, 41 three-day records, and 33 seven-day records would be necessary to establish a difference of 6.5 gm. protein as significant. When this formula was applied to milk, two samples of 214 one-day records, 127 three-day records, and 93 seven-day records would be necessary to establish a difference of 0.33 cups milk. To establish a 10 per cent difference between two surveys of vitamin A (500 I.U.), two samples of 812 one-day records, 442 three-day records, or 303 seven-day records would be required. If servings of foods high in carotene or high in ascorbic acid are to be compared, it was found that two samples of 350 seven-day records would be needed to establish 10 per cent differences between servings of food high in carotene, but for ascorbic acid foods, 163 seven-day samples would be sufficient.

From these results, it has been demonstrated that both the size of the samples and length of the survey necessary to give a stated amount of stability depend on the nutrient being studied. The larger the sample, the shorter is the time required. Nutrients, such as protein, which show smaller variations in intake require shorter periods and smaller samples. When the variations are great, the sample must be larger and the periods longer. From a practical viewpoint, estimating servings of carotene-rich foods does not require a much larger sample than estimating vitamin A when one considers the time it takes to calculate vitamin A from the food record.

SUMMARY

Seven-day dietary records collected from two Chicago schools showed daily variations in the eating patterns of children. Three items, milk, protein, and vitamin A (including carotene), were investigated. Protein and milk showed approximately the same amount of day-to-day association as demonstrated by the correlation coefficients. Vitamin A showed little or no daily correlation. The correlation coefficients showed no day-to-day consistencies. In comparing daily mean value of the items, there was no evidence that mean intakes were higher on some days than on others.

Dietary records for one day, three days (Tuesday, Wednesday, and Thursday), and seven days were examined. It is apparent that the duration of a survey should depend on the nutrient or food being studied. The value of a three-day study in contrast to a one-day study was shown by a reduction in the standard deviation. When the study was lengthened to seven days, a further reduction in the standard deviation resulted. The extent of these reductions depended on the nutrient or food under investigation. Similarly, the means became more stable as the study was lengthened, again depending on the nutrient or food.

The size of the samples suitable for comparison depended on the nutrient or food being studied. For example, the intake of protein showed less variation than did vitamin A; a smaller sample was required for the same degree of stability. Therefore, having established the limits of possible differences for the mean, the deciding factor for determining the length of the survey and the size of the sample would be the variations in intake of the food or nutrient concerned.

Dietary intake studies are expensive and time consuming. Thought should be given to the technique and sampling methods before a study is undertaken. For that purpose, a pilot study should be initiated to determine the variations in food consumption prevalent in the population to be studied, so that the size of the sample and the duration of the study can be planned effectively.

REFERENCE

(1) TRULSON, M. F.: Assessment of dietary study methods. 1. Comparison of methods for obtaining data for clinical work. J. Am. Dietet. A. 30: 991, 1954.

BIOGRAPHICAL NOTES FROM THE HISTORY OF NUTRITION

Antoine Laurent Lavoisier—August 26, 1743—May 8, 1794

Lavoisier has been called the father of nutrition. He made no new discoveries; rather his was the mind that could interpret and synthesize the knowledge of that period and create from it a system which became the basis of modern chemistry. Priestley had discovered "dephlogisticated air" (1774). This, Lavoisier studied further and by quantitative heating of elements such as sulphur and phosphorus, and calces (oxides) such as mercury oxide, he was able to show that combustion was a process of combination with this new gas. This gas he named "oxygen" (1779). He also renamed Cavendish's "inflammable air," hydrogen. By experiments, always made with the careful use of the balance and by logical deduction, Lavoisier overthrew the old phlogiston theory and set up a new system of chemistry. This he described in his book, *Elements of Chemistry*, (1789). The chemical names given to a substance indicated the elements of which it was composed and the way in which those elements were combined. It made possible the writing of chemical formulas we use today.

Lavoisier showed that oxygen was converted to "fixed air" (carbon dioxide) in the lungs and concluded that body heat was maintained by the release of heat in this process. Later workers showed that these oxidative processes took place in muscle tissue, not in the lungs.

From the study of combustion and the calcination (oxidation) of metals, Lavoisier showed that respiration was a chemical and not a mechanical process and that it was a function of oxygen. The rest of his life was devoted to the study of respiration. With Laplace, he built an ice calorimeter and by measuring the amount of ice melted in a given time by the body heat from a guinea pig, he demonstrated that animal heat was derived from oxidation within the body. He continued his calorimetric studies, showing that body oxidation was increased during digestion, movement, exercise, work, and at low temperatures. He concluded that men at heavy labor needed more food than ordinary workers. Lavoisier showed that respiration involved the combustion of carbon and hydrogen of food and the production of carbon dioxide, water, heat, and energy. Thus was the foundation of modern nutrition laid.

The story of Lavoisier's life and death on the guillotine is a familiar one. He was born August 26, 1743, of well-to-do parents and educated in the best schools with a sound training in the classics and mathematics. He was highly methodical and of untiring activity; he had a keen sense of observation and clear vision of problems to be solved; he also had adequate funds to spend lavishly on equipment for his experiments. These attributes, combined with great powers of concentration, a keen intellect, and a broad interest in his fellow man, made it possible for him to achieve distinction as a chemist, geologist, cartographer, economist, agriculturist, social reformer, and formulator of a national system of education.

In 1771 Lavoisier married Marie Anne Paulze, who was his devoted companion and who became the perfect laboratory assistant and secretary; she translated foreign manuscripts for him and made accurate drawings of his apparatus and experiments for his books.

REFERENCES: Dupont, L.: Lavoisier—an estime. Chem. & Engin. News 22: 520, 1944; McKie, D.: Antoine Lavoisier. N. Y.: Henry Schuman, 1952; Barclay, A.: Pure Chemistry. A Brief Outline of Its History and Development. Pt. I. Historical Review. London: H. M. Stationery Office, 1937.—*Contributed by E. Neige Todhunter, Ph.D., Dean, School of Home Economics, University of Alabama, Tuscaloosa.*

Book Reviews

Food Service in Institutions. Third Edition. By Bessie Brooks West and LeVelle Wood. New York: John Wiley & Sons, Inc., 1955. Cloth. Pp. 682. Price $7.50.

This third edition of *Food Service in Institutions*, as did the first two, presents a compilation of material on the various aspects of food management. The scope of the subject indicates the complexity of the problem, and the wealth of material available is difficult to compress in any one book. While it has been impossible to cover all phases in detail, the authors have selected wisely and have presented their material in a clear, concise, and interesting manner.

The book consists of three sections. Excellent bibliographies at the end of each chapter make it possible for students to delve more deeply into any subject of special interest.

Section I, "Food Preparation and Service," has been revised to contain many valuable additions. There is greater emphasis on quantity cookery methods and purchasing procedures, and on menu planning for groups. The review and application of scientific principles and the revised charts and data tables as applied to quantity cookery are especially useful.

Much new information is included in Section II, "Organization and Administration of Food Services." Especially to be commended are the discussions of job analysis and job specifications, work simplification, and sanitation. These subjects are presented clearly and are well illustrated. The authors, realizing the importance of personnel management, have also included the latest information on this subject and have provided one of the few sources where this important subject has been applied to personnel in food services. The chapter on cost control as a tool of management contains much helpful information.

The discussion of professional requirements is perhaps too specific and might well have been omitted since these are constantly being reviewed and revised and thus may vary from time to time. Readers could be referred to readily available sources for such information.

The last section, "Food Service Planning," has been almost completely rewritten and is perhaps the most valuable section of the book. The discussion of space requirements and equipment specifications is illustrated with fine photographs of modern equipment and installations, flow charts, and data tables to make this section especially valuable. Considerable emphasis is placed on architectural features and materials, but the relationship of these features to efficient management has been clearly defined.

Managers of food services will find this book a ready source of pertinent information. For those managing a residence hall, the material in the appendix will be of value. The real worth of the book, however, will be as a textbook, since it gives not only much basic information but shows the relationship and importance of all aspects of management in achieving food of high quality in institutions.—*E. Evelyn Smith, Associate Professor of Institution Management, University of Illinois, Urbana.*

Management of Addictions. Edward Podolsky, M.D., Editor. New York: Philosophical Library, 1955. Cloth. Pp. 431. Price $7.50.

One chapter of this book deals with "Nutrition in Alcoholism." Written by Ruth Woods, the discussion is concerned primarily with the work of Roger Williams of Texas and his concept of genetotrophic disease. Williams and coworkers have postulated that genetic variations among "normal" individuals may be reflected in variations in quantitative requirement for individual nutrients. This has led to the theory of the partial genetic block. Williams has investigated the variation of drinking patterns of rats before and after supplementation with vitamins and has used his ideas in the clinical treatment of the alcoholic person, although he does not claim that nutritional supplements are the cure-all for the alcoholic. The author uses some case histories from Williams' work as examples of the effects of vitamin therapy.

This reviewer has had considerable experience with the effects of supplementary vitamins and placebos in the treatment of alcoholism. Her results have been definitely discouraging when judged on a long-term basis. In fact, placebo therapy has been as effective as vitamins for total abstinence.

As in the case of any book, new investigations have recently been reported in the literature which could not be included in the book because of time elements. For example, some investigators are now in a controversy over the rat studies of Williams and Mardones. Others are likewise contending that proper nutrition never made a moderate drinker out of an alcoholic.

While this chapter is interesting reading, it would have been stronger if an evaluation of Williams' work had been made rather than a simple report without interpretation.—*Martha Trulson, D.Sc., Department of Nutrition, Harvard School of Public Health, Boston.*

The Complete Book of Outdoor Cookery. By Helen Evans Brown and James A. Beard. New York: Doubleday & Company, Inc., 1955. Cloth. Pp. 255. Price $3.95.

This book was prepared to take advantage of the current vogue for outdoor cooking. As patio life, long enjoyed by westerners, becomes more the custom in the eastern states, at least in summer, outdoor eating is gaining in popularity, both for family and guests.

The authors have hewed to their subject well, not digressing to other types of cooking, while including all types of pertinent information. The book includes chapters on types of grills, including makeshifts, and on fires and fuel, in which the characteristics of charcoal wood, and briquets, are all described. An appendix presents instructions and scale drawings for building a barbecue grill.

Recipes run the gamut of courses, from appetizers to desserts, and attention is given to smoke cookery as well as grilling. Some of the recipes do not necessarily require preparation over coals; they may be cooked in the kitchen oven or in an electrical device near the grill.

The last three chapters, "Picnics and Cook-outs," "Camp Cookery," and "Galley and Trailer Cookery," contain recipes, menus, and suggestions which the dietitian in a diabetic camp or Girl Scout camp might find welcome and adaptable.

RECENT BOOKS RECEIVED

Manual for Hospital Purchasing & Inventory Control. By E. C. Wolf. Minneapolis: Burgess Publishing Company, 1955. Fabricoid, spiral bound. Pp. 143. Price $4.

Everybody's Book of Modern Diet and Nutrition. By Dr. Henrietta Fleck and Dr. Elizabeth Munves. New York: Dell Books, 1955. Paper. Pp. 320. Price 35 cents.

Tips on Administration

In 1954, the Food Administration Section of The American Dietetic Association conducted a contest on "What We Have Done to Improve Supervision in Our Food Service Unit." Published here are the first two award entries, an honorable mention entry

Requisitioning and Portioning Aid

Our hospital has a central purchasing department, a central stores department, one central main kitchen, seven serving stations for patients, and three dining halls for personnel. Our problem was to develop a guide, or rule of thumb, to help our dietary staff and workers in the accurate requisitioning, issuing, and serving of food from the kitchen.

To solve the problem, an indexed table in folder form was prepared in which the serving utensils, serving portions (both by measure and weight), and information for requisitioning and issuing are listed for all foods used in the hospital. For example, the table specifies for a jelly roll that a spatula and knife are the serving utensils; the serving portion is 1 slice, weighing 60 gm.; and there are 24 servings in one jelly roll. Similar figures are given for each product. On the inside cover of the folder are also listed abbreviations used in the tables, the sizes and characteristics of serving utensils, portion cups, aluminum pans, and a shallow stainless steel inset.

The folder is divided or indexed in six sections, with foods grouped as follows: beverages, bread and crackers, cereals, and dairy products; desserts, dessert sauces, and eggs; fruits and fruit juices; meats, fish, and fowl; meat substitutes, meat and fish sauces, and miscellaneous; potatoes, potato substitutes, and salad; and salad base, garnish, dressing, soups, sweets and vegetables.

The specificity of the tables makes it possible to order out foods and to serve with greater accuracy, thus effecting a reduction in waste and more precise food cost control.—*Ruth Nickel, Saint Marys Hospital, Rochester, Minnesota.*

Task Statements and Performance Standards

Our problem was to find a means of developing greater cooperation on the part of employees. To solve the problem, task statements and performance standards were mutually worked out. The statements are now used in periodic discussions of progress with the individual employees. Through their use, employees know how well they are measuring up to the work expectations of both their supervisor and fellow workers.

These mutually developed task statements and performance standards have provided us with an effective method of breaking the communications barrier between supervisors and the supervised, and wholesome attitudes, knowledge, and understanding of the requirements of the job beyond that of mere manual skill have been established. Workers quickly learn the characteristics of good performance, and recognition by fellow workers becomes as important as recognition by the supervisor. The supervisor is accepted as a coordinator and integrator to help improve methods and working conditions, planning with each worker for his growth and advancement.

Workers are achieving ability to evaluate continually their success and thereby are constantly stimulated to performance improvement. Absenteeism has decreased, and morale has replaced discipline. Supervisors are released from watch-dog activity to concentrate on broader aspects of management.—*Ruth Dickie, University of Wisconsin Hospitals, Madison.*

Non-Professional Supervisors

Our hospital is an institution of 1000 beds, consisting of a general hospital, a tuberculosis hospital, and a unit for contagious diseases. The Dietary Department was staffed by ten dietitians when we were faced with a twofold problem in supervision. The ward kitchens in the general hospital (at that time part of the Nursing Department) were to be transferred to the Dietary Department. There were fourteen kitchens to be handled with the help of only one additional dietitian. Also, the main kitchen, cafeteria, and related units were soon to be expanded when a new building was finished.

To provide for supervision of the ward kitchens and of the new units, we established a one-year training course for food service supervisors. The course was organized with the cooperation of the Cleveland Board of Education and the Hospital Council. Students spend one semester at the vocational high school for girls and eight months in practical training in the hospital, receiving experience in all units of the Dietary Department. Classes on pertinent subjects are also presented during the hospital experience. (See this JOURNAL, July 1953, page 689.)

The graduates of this program have been added to the staff in almost all units of the department. They are currently supervising in the main kitchen, cafeteria, and ward food service; one is also doing our employee training.

This plan has enabled us not only to solve our original problems of shortage of supervisory personnel, but also to assume responsibility for the contagious unit as well, and we are now planning for the transfer of the kitchens in the tuberculosis hospital to the Dietary Department's jurisdiction. Although the organization and maintenance of the program has involved more time and effort than we originally anticipated, we have found that it can be done and feel that the benefits outweigh the disadvantages. Dietitians have been relieved of many routine details and are now able to do basic planning and overall supervision on a level with their training. As a result, they are more interested and enthusiastic about their work. In addition, we have a continuous supply of trained supervisory personnel.

We only wish that we could recruit more students for this training program.—*Frances Zeman, City Hospital, Cleveland.*

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Letters to the Editor . . .

Our New Cover

To the Editor:

All of us in the Central Office of the Veterans Administration were greatly pleased with the new cover of the Journal, and I want to congratulate you on this interesting improvement in a fine Journal that is always brimful of worthwhile material for all of us.

Grace Bulman
Chief, Dietetic Division
Department of Medicine and Surgery
Veterans Administration
Washington, D. C.

To the Editor:

My warmest congratulations on the new cover for the Journal. It is the first we have ever had that seems completely satisfactory—to me at least.

Mary P. Huddleson
Former Editor
Journal of The American Dietetic Association
Washington, D. C.

To the Editor:

The Journal is simply beautiful! It is stunning and fresh. Congratulations on giving us such a distinguished look!

Lucille M. Refshauge
Director of Dietetics
Hartford Hospital
Hartford, Connecticut

To the Editor:

The new cover of the Journal is extremely attractive, and I have heard many favorable comments regarding it.

Edith A. Jones
Chief, Nutrition Department
Clinical Center
National Institutes of Health
Department of Health, Education, and Welfare
Bethesda, Maryland

To the Editor:

When I took the January issue of the Journal from its wrapper, I was thrilled. The lovely blue, the A.D.A. seal so impressive, the word "dietetic" standing out so prominently, the uncluttered appearance of the page, the nice contrast of black and white print, and the fine taste of the whole format are striking. Thank you for making ours one of the best looking professional publications.

Sister Mary Cecilia
Chief Dietitian
Divine Providence Hospital
Pittsburgh

Anti-Oxidant Prevents Browning of Peeled Potatoes

To the Editor:

I would like to know what is used to keep peeled potatoes bought from a dealer from discoloring. Can these already-peeled potatoes be used in modified diets?

Elizabeth E. Halleck
Chief Dietitian
The Greenwich Hospital Association
Greenwich, Connecticut

Editor's Note: Sodium bisulphite is usually the anti-oxidant used to keep peeled potatoes white. The Food and Drug Administration advises that it is a harmless preservative and that the product as sold should bear a label declaring the content of bisulphite, in accordance with regulations of the Food and Drug Administration.

A recent report in *Food Technology* states that sodium bisulphite caused the loss of 13 per cent thiamine in Florida potatoes and 11 per cent in a Maine variety. Losses of thiamine in prepeeled French fries were much greater—47 and 30 per cent—due undoubtedly to the larger surface area which came in contact with the bisulphite solution.

The only modified diets which would be affected by the use of sodium bisulphite would be those in which the sodium is restricted or acid-alkaline ash diets.

Foods for Low-Sodium Diets

To the Editor:

We are using the "Basic Plan for Sodium-Restricted Diet" (Table 28) of the *Handbook of Diet Therapy* (Chicago: University of Chicago Press, 1952). Several questions have come to our attention concerning this tabulation.

In the footnotes, it is stated that quick-cooking cereals have been omitted, but that oatmeal and farina are included. Does this mean that quick-cooking oatmeal is omitted, and all other cereals, such as Wheatena and Instant Ralston?

Also, peas, Lima beans, and sweet potatoes are not mentioned in the vegetables listed in the footnotes. Are these vegetables to be excluded?

Ruth L. Baker
Chief Dietitian
The Lancaster General Hospital
Lancaster, Pennsylvania

Editor's Note: The only cereals used in making up the figures given in this table are the five which are listed: oatmeal, farina, Shredded Wheat, Puffed Wheat, and Puffed Rice. Quick-cooking and enriched farina are omitted because of the sodium content of the quick-cooking agent. According to our information, quick-cooking oatmeal is produced by reducing the size of the flake. *Sodium-Restricted Diets* (Bull. No. 325, National Academy of Science—National Research Council, 1954) reports that Instant Ralston and Wheatena are both low in sodium, containing 2 mg. sodium per 100 gm. Since these values are similar to the other low-sodium cereals in the table, these two foods could be used without altering the values in the table significantly.

Peas and Lima beans have been omitted because of the brine used in sorting and as a blanching agent in freezing. Sodium hydroxide is commonly used in peeling sweet potatoes, and canned sweet potatoes are reported to have a value of 48 mg. sodium per 100 gm. The value for raw sweet potatoes is 10 mg. per 100 gm.

In the tables in the *Handbook*, values were usually computed in terms of commonly used foods, according to food consumption data

from the U. S. Department of Agriculture ("Consumption of Food in the United States 1909–1948," Misc. Pub. No. 691, 1949). Because fresh peas, fresh Lima beans, and sweet potatoes freshly cooked constitute such a small part of the market, these vegetables were omitted. They should all be equally good in the sodium-restricted diet, if available.

Patient Contact[1]

TO THE EDITOR:

The article by Grace White, "The Patient as the Focus of Attention" in the January 1954 issue of the JOURNAL has clarified my own thinking on the subject—a subject which has been on my mind for a long time.

Miss White's views present my own frustrating problems encountered in almost twenty-five years as a hospital dietitian, as far as personal contact with patients is concerned. In the small hospital of about one hundred beds, the lone dietitian has more opportunity for that coveted personal contact with patients, but usually at the expense of long, long hours on duty and "on call" returns during time off. I think it is time for the dietetic profession to reconsider and to re-evaluate the position of its members engaged in hospital service in relation to the rest of the hospital team.

In most hospitals, reward for efficiency has always been promotion—not to more responsibility for personal contact with patients, but to greater responsibility in administrative duties, leaving to the less experienced dietitian the face-to-face work with patients. There are admirable exceptions of dietitians refusing promotions—and concomitant salary increases—in order to continue their work with patients unhampered by administrative details.

Of course, administrative work in the dietary department must be done, and efficiently, but couldn't hospital administrators be taught to realize that trained food supervisors or managers are the logical persons for such work? Why should the dietitian, with her ever-enlarging scientific training, be burdened with administrative duties as no other member of the medical team is? Does a surgeon become a hospital administrator as a reward for efficiency, or even supervisor of surgery? He may become chief of staff, but his interests continue to lie in the field of direct contact with patients' surgical needs. And so it is with all other branches of the medical team. Who is to blame? Possibly our own profession. Have we sold ourselves adequately to the medical profession generally so that physicians have learned to rely on the dietitian as an important member of their team in the same way that they rely on the pathologist, the laboratory technician, and the radiologist? I think not.

Doctors will order all kinds of laboratory tests, X-rays, various therapies, using all the specialized skills only a hospital staff can offer, and then give their patients their own diet sheets without explanation, or have the nurse call down for a diet list as the patient is being discharged. What happens? The patient is often bewildered and sooner or later gives up the attempt to follow his diet. In instances where the dietitian is called to give instruction much can be accomplished. When time is short, an invitation to come back for further help brings surprising results. Many take advantage of the opportunity. Their difficulties and problems are varied indeed and offer a real challenge to one's ingenuity.

We, as dietitians, could improve medical service by presenting our profession to the average general medical practitioner. Doctors must learn that a diet list cannot probe the patient's problems. It cannot sound out his economic status or know that he needs help in planning his diet to suit his working conditions or that it must work in with the needs or the abilities of other members of the family. How can the problem be best presented?

Several approaches are feasible, for instance: letters sent to all members of a state medical society enclosing names of dietitians in the locality; dramatic skits at medical conventions and meetings; and talks by dietitians at hospital staff meetings. With such conditioning, the time should come when doctors themselves will demand more help from dietitians for hospital and private patients. Only then can most dietitians cease to be jacks-of-all-trades in the hospital field, unhampered by kitchen problems of hiring and scheduling employees, purchasing food and equipment; maintaining sanitation and repairs, and guiding the million and one things which require time that should be devoted to patients.

JULIA A. LONGENFELDER
Gasconade, Missouri

[1]Reprinted with permission from *Missouri Mutterings*.

Monosodium Glutamate in Frozen Foods

TO THE EDITOR:

Our attention has been called to the article in your March 1953 issue by Donald K. Tressler, "What Is New in Frozen Foods." We are especially interested in obtaining further information on the statement that monosodium glutamate prevents dehydration and rancidity.

GUNN PETURSSON
The Coldwater Seafood Corporation
New York, New York

EDITOR'S NOTE: The author quotes two research reports on the use of monosodium glutamate with frozen foods which may be helpful in this respect: (a) "Monosodium Glutamate Sharpens Flavor in Quick Frozen Foods" by G. A. Shuey and W. R. Eichenberg. Quick Frozen Foods 13: 59 (July), 1951; and (b) "The Use of Monosodium Glutamate in Frozen Foods" by K. B. Norton, D. K. Tressler, and L. D. Farkas. Food Technology 6: 405, 1952.

West Indian Cherry

TO THE EDITOR:

We have noted an article in the February issue of the JOURNAL concerning acerola and would like further information about the juice of this fruit. Could you indicate the address of Harvey Greenspan of Miami, who has, we believe, undertaken the intensive cultivation of acerola? We are very keen on obtaining literature and sample.

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EDITOR'S NOTE: Harvey Greenspan, who is promoting the commercial growing and use of acerola, or West Indian cherry, is Chairman of the Board, Bib Corporation, Lakeland, Florida.

Current Literature

Contributed by Mildred Bonnell and administrative dietetic interns, University of Washington, Seattle; Janette C. Carlsen and Ethel M. Miller, The Johns Hopkins Hospital, Baltimore; Marjorie Cheney, Dietetic Intern, VA Center, Los Angeles; Elizabeth H. Tuft, Wesley Memorial Hospital, Chicago; and the Journal staff

THE AMERICAN JOURNAL OF CLINICAL NUTRITION

Vol. 3, March–April, 1955

* Nutrition and psyche with special reference to experimental psychodietetics. J. Brozek.—p. 101.

Does a low intake of calcium cause or promote the development of rickets? A. R. P. Walker.—p. 114.

* Biochemical and nutritional effects of lysine-reinforced diets. A. A. Albanese, R. A. Higgons, G. M. Hyde, and L. Orto.—p. 121.

* Nutrition and the preschool child. Dietotherapy. L. Weng.—p. 150.

Nutrition and Psyche. The impact of food on behavior in man, with a brief reference to animal studies, is discussed. Selected illustrative studies are reviewed, with particular reference to the effects of the variations in the intake of calories and vitamins and amino acids, specifically glutamic acid. Beneficial psychologic effects of the supplementation of a good "average" diet of "normal" individuals with any nutrient still remains to be demonstrated. At the same time, there is no doubt that dietary deficiencies affect profoundly man's willingness and capacity for work and alter his personality. As a rule, these alterations in attitude and behavior simulate psychoneurosis, although in some instances faulty diet may bring about psychotic changes, associated with profound disorders of the central nervous system. In industry, agriculture, and the majority of military operations, brute force is being steadily replaced by that of the machine. Consequently, in testing man's "fitness" in reference to the dietary intake, the importance of psychologic components of fitness has been steadily increasing. Motivation particularly is readily affected by improper nutrition. Apathy and psychoneurosis, experimentally induced, have their counterpart in the behavior and attitudes of malnourished populations. Further extension of the knowledge of "psychodietetics" is one of the challenging tasks for the science of nutrition.

Lysine-Reinforced Diets. Fifteen infants one to twenty-seven months old were studied for periods of nine to twenty-one weeks to determine whether the nutritive value of milk could be improved by lysine supplements. The children were fed standard fresh or evaporated milk formulas with supplementary foods; the vitamin and mineral content of the diet was as high as, or higher than, the recommended levels. The supplement was given as L-lysine, hydrochloric acid at the rate of 100 mg. lysine per kilogram per day. Body weight and nitrogen balances of five of the fifteen infants were markedly improved. Six children had no spectacular weight gains, but urinalyses showed that more nitrogen was retained than before the lysine was added. Blood protein levels also increased. The remaining four infants showed no observable improvement, indicating that lysine-fortified diets are only effective with children who are not receiving adequate nourishment from their food. It is thus implied that the nutritional value of many infant foods, including cow's milk, can be substantially improved by small additions of lysine.

Nutrition and the Preschool Child. Although the question of "what" to feed children is of the utmost importance, we must always recognize that while general guides are helpful when applied to groups of children, they may need adaptation when applied to individuals. A table summarizes the major food groups that should be included in meal plans for the preschool child, amounts recommended, and the average size serving that children from one to six years may be expected to eat. When this guide is followed, it is reasonable to assume that the Recommended Dietary Allowances for specific nutrients will also be met. A meal pattern is presented. The recommended food groups are briefly discussed. It is also stressed that pleasant eating experiences as well as proper foods are important to the successful feeding of children.

THE AMERICAN JOURNAL OF THE MEDICAL SCIENCES

Vol. 229, May, 1955

* A new approach to the treatment of gastrointestinal distress. E. Roberts.—p. 496.

Treatment of Gastrointestinal Distress. A D-amphetamine sulphate-amobarbital compound for the alleviation of psychic stress plus belladonna for physical relief was tried on seventy-six patients with functional gastrointestinal disturbances. Of these, seventy-four benefited from the treatment. The D-amphetamine sulphate-amobarbital compound relieved the nervous tension and anxiety, while the belladonna had the desirable antispasmodic effect. All patients became more cheerful and relaxed; furthermore, they were able to eat a wider variety of foods without ill effect.

AMERICAN JOURNAL OF PUBLIC HEALTH

Vol. 45, May, 1955

* Attending the nutritional needs of patients in nursing homes—theory and practice. J. H. Kinnaman, J. H. Browe, E. M. Agnew, and R. N. Nelson.—p. 627.

Nutritional Needs of Nursing Home Patients. More information is needed on how actual food and nutrition practices compare with good theoretical standards if the diets for patients in nursing homes are to be adequate in amount and in the essential nutrients. A study of twenty licensed nursing homes in Nassau County, New York, showed that in most instances, food storage was better than in public eating places. No dietitian or a person with training in nutrition was employed in any home, and in most cases, the cook was given little or no supervision. The quantity, preparation, and service of food were good. Some indicated improvements in food service include: using garnishes; serving supper later; supervising the cook more closely; developing standardized recipes; expanding and modernizing kitchens; replacing old and purchasing additional mechanical aids to food preparation and service and dish and utensil care; improving both physical set-up and use of dining room facilities; and modifying diets according to changes in clinical condition of patient.

ANNALS OF INTERNAL MEDICINE

Vol. 42, April, 1955

* Impaired glucose tolerance, a consequence of excessive carbohydrate consumption. S. Alpert.—p. 927.

Impaired Glucose Tolerance. The impairment of glucose tolerance following ingestion of an excessive amount of carbohydrate is reported. Recovery of normal function, though it lagged, followed the adoption of restrained dietary habits. A plausible explanation of the phenomenon, based on laboratory work, is that the mechanism for such damage is functional overstimulation of the pancreatic islet tissue through excessive demand for insulin. Where the demand is maintained, exhaustion develops, reflected anatomically by degranulation. If the overstimulation continues, ultimately irreversible changes in the form of complete degeneration and atrophy ensue.

ARCHIVES OF INTERNAL MEDICINE

Vol. 95, March, 1955

Renal factors in regulation of electrolyte balance. L. G. Welt.—p. 365.

The problem of hypokaliemia. T. S. Danowski.—p. 370.

Hyponatremic syndrome. E. V. Newman.—p. 374.

Problems of electrolyte and water balance in nephrotic syndrome. J. A. Luetscher, Jr.—p. 380.

Management of congestive heart failure. Management designed to avoid serious disturbances of electrolyte and water balance. D. W. Seldin.—p. 385.

* Milk-alkali syndrome. Review of eight cases. D. A. Scholz and F. R. Keating, Jr.—p. 460.

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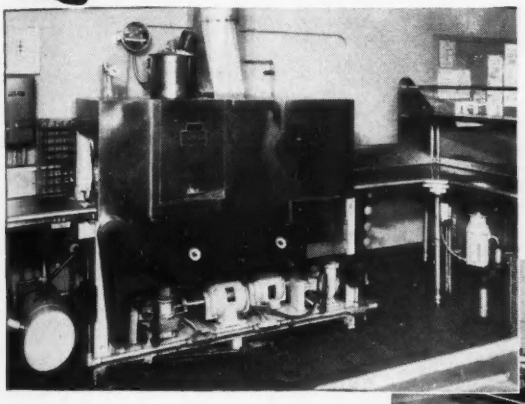

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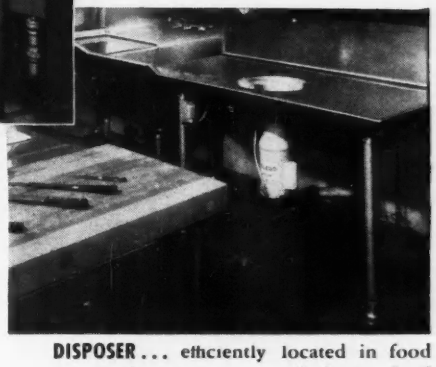

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* Treatment of macrocytic anemias. R. W. Vilter.—p. 482.

Vol. 95, April, 1955

* Abnormalities of body water, sodium, potassium, and magnesium. Pathogenesis, clinical manifestations, and treatment. G. B. Myers and L. T. Iseri.—p. 503.
* Vitamin B_{12} deficiency following total gastrectomy. W. R. Pitney and M. R. Beard.—p. 591.
* Carbohydrate metabolism in brain disease. 5. Effect of epinephrine on intermediary carbohydrate metabolism in schizophrenic and manic-depressive psychoses. D. H. Henneman, M. D. Altschule, R. M. Goncz, and P. Davis.—p. 594.

Milk-Alkali Syndrome. The syndrome is characterized by hypercalcemia, renal insufficiency, azotemia and, occasionally, by alkalosis. The condition appears to be distinguishable from primary hyperparathyroidism by the absence of hypercalciuria and because of the rapidity with which the azotemia and hypercalcemia disappear on omission of milk and antacids containing absorbable alkalis.

Treatment of Macrocytic Anemias. Anemias characterized by large erythrocytes are usually caused by lack of one of the erythrocyte maturation factors, vitamin B_{12} or folinic acid. The young erythrocytes in the bone marrow are megaloblastic, and maturation of myeloid elements and karyocytes is bizarre. The vitamin B_{12} and folinic acids are catalysts in the chemical chain reaction which is necessary for the formation of the nucleic acids, particularly the deoxyribose-containing type. Macrocytosis may also occur during the course of chronic liver disease, hypothyroidism, and refractory, hypoplastic, or chronic hemolytic anemia. In these types, the bone marrow is not megaloblastic, and the hemopoietic vitamins are valueless unless a secondary deficiency of one of them has occurred.

Abnormalities of Body Water, Sodium, Potassium, and Magnesium. A comprehensive discussion of the subject is presented and illustrated with many diagrams.

Vitamin B_{12} Deficiency Following Gastrectomy. Intrinsic factor is essential, in man, for the absorption of the small amounts of vitamin B_{12} normally present in the diet. There is evidence that the stomach is the only site of secretion of intrinsic factor. In the patient reported, inadequate absorption of dietary vitamin B_{12} apparently existed for eighteen months following a total gastrectomy. There is evidence that serum has a greater affinity for vitamin B_{12} than has liver tissue and that the body can maintain a normal serum level in the presence of greatly depleted liver stores. As a result of this advantageous mechanism which tends to furnish an adequate supply of vitamin B_{12} to the bone marrow, even in the presence of a deficiency, megaloblastic anemia may not develop.

Carbohydrate Metabolism in Brain Tissue. Carbohydrate metabolism after injection of epinephrine was studied in normal subjects and in patients with psychoses. Rises in true blood glucose and lactic acid concentrations were normal in patients with psychoses of recent onset but were decreased in patients with chronic psychoses who had not undergone lobotomies. The changes in blood pyruvic, citric, and a-ketoglutaric acid concentrations were the same in normal subjects, in patients with psychoses (schizophrenia and manic-depressive) of recent onset, and in patients with chronic psychoses with and without previous lobotomy.

CANADIAN MEDICAL ASSOCIATION JOURNAL

Vol. 72, May 1, 1955

* The Belcher gastrectomy for peptic ulcer (A preliminary report). D. G. MacQueen.—p. 666.

Vol. 72, May 15, 1955

* Gout. H. G. Kelly.—p. 735.

Gastrectomy for Peptic Ulcer. One hundred patients with gastrectomies for peptic ulcer were surveyed. Some 70 per cent were not up to par physically. Despite an adequate intake of nutritious food, this large group failed to attain optimal weight and when pressed, admitted undue fatigue. Half of this 70 per cent of underweight patients had some post-gastrectomy syndrome, and a third were frank "dumpers." A severe reaction in a "dumper" could be induced by a milk shake containing 70 gm. refined sugar—and by the same method, a potential dumper could be detected before leaving the hospital, but the sugar tolerance curves of these people were inconclusive and spot blood sugar taken during an attack did not fluctuate widely or rapidly enough to induce such symptoms. The most satisfactory treatment was to eat dry meals (no soup, milk, or coffee) and to avoid refined sugar at all times in an attempt to retard emptying time and dilatation of the jejunum.

Gout. Gout can be treated with medication plus diet, designed to reduce the formation of uric acid, which has both endogenous and exogenous sources. The body can synthesize uric acid from elementary substance, which means that not only purines but also carbohydrates, proteins, and fats are potential precursors. Nothing can be done to alter the endogenous production of uric acid, and it is quite apparent from recent findings that no rigid restriction of exogenous sources is possible. However, there are patients whose urinary excretion of uric acid can be greatly modified by diet, and undoubtedly dietary restriction should be tried. A Spartan diet which eliminates purines, restricts proteins and fat, and leaves the bulk of food composed of cereals, grain products, eggs, cheese, milk, non-leguminous vegetables, and fruits is prescribed first. Later restrictions are loosened and the patient is watched. Patients, by their own choosing, continue to curb their appetities. Even when no strict diet is followed, it is wise to avoid gluttony because, as stress, it may provoke acute gout.

FOOD TECHNOLOGY

Vol. 9, May, 1955

* Physical properties of cake as affected by method of butter manufacture and addition of an emulsifying agent. F. E. Hunt and M. E. Green.—p. 241.

Improvements required in the freezing, storage and distribution of frozen foods. W. J. Finnegan.—p. 259.

Microscopic structure of frozen cake batters. A. O. Mackey.—p. 261.

* Effect of storage temperature on quality of canned grapefruit sections. R. L. Huggart, F. W. Wenzel, and E. L. Moore.—p. 268.

Effect on Cake of Method of Butter Manufacture and Addition of an Emulsifier. Use of 92-score butter manufactured by two different methods and with and without an added emulsifying agent was investigated as shortening for plain cake. The liquid emulsifying agent, incorporated in the butters at a 3.5 per cent level, was of a mono- and diglyceride type and of vegetable origin. The cakes were made according to a medium-sugar formula and modified flour-batter method of mixing. Batters made with either type of butter containing no added emulsifier were well aerated and relatively viscous, but had a curdled appearance. Addition of the emulsifying agent to either kind of butter resulted in batters which were smooth, runny, and had a higher specific gravity than those prepared from the butter containing no emulsifier. Volume of cakes seemed to be slightly improved with the emulsifying agent using either kind of butter. The emulsifying agent also aided in dispersion of fat and of gas cells throughout the batter and resulted in a more even fat distribution in the finished cake.

Storage Temperature and Quality of Canned Grapefruit. Selected samples representative of a good commercial pack of canned grapefruit segments were stored for one year at carefully controlled temperatures of 32°, 60°, 70°, 80°, and 90°F. to determine the rate of degradation of flavor, color, and firmness. After three months, the flavor in the product stored at 90°F. was markedly different from the control sample stored at 32°F.; color and firmness showed changes in three to six months. At 80°F., the grapefruit sections were of good quality for three to six months, but showed marked changes in color and firmness and objectionable changes in flavor at twelve months. The 70°F. storage sample showed slight changes after one year. Therefore, for maintenance of original good quality in canned grapefruit sections, the products should be held at 70°F. or lower. A general trend was noted in the changes in the pectic substances, although there was considerable variation among samples. Protopectin decreased with storage time and with increase of storage temperature. More water-soluble and polyphosphate-soluble pectins were present in the samples held at the higher temperatures.

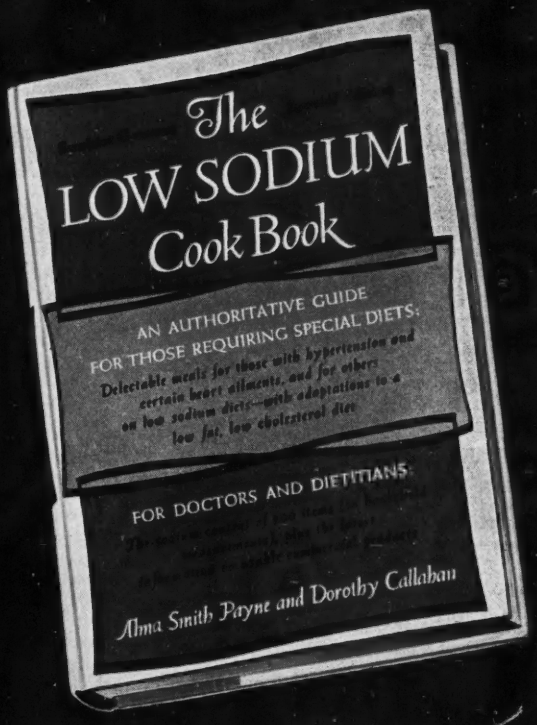
INDUSTRIAL MEDICINE AND SURGERY

Vol. 24, April, 1955

* A nutritional factor in TNT poisoning. A study of fifty employees exposed to the toxic influence of handling trinitrotoluene. J. M. Devereux.—p. 171.

Nutritional Factor in TNT Poisoning. This study of fifty individuals with TNT poisoning would seem to indicate

REPEAT OFFER !



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*By Alma Smith Payne and Dorothy Callahan, research dietitian, Massachusetts General Hospital, with introduction by Francis L. Chamberlain, M.D., M.Sc.D.

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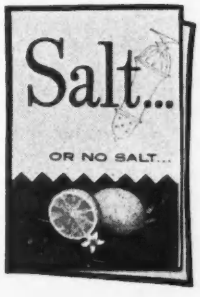

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that some individuals who are affected will recover—in this particular case from an anemia—without being taken "out of contact" with the toxic substance and without taking large amounts of therapeutic acids sometimes considered essential in the treatment of anemia. By supplying individuals with a high-protein, low-carbohydrate, and low-fat dietary supplement, efficiency is increased and absenteeism reduced to a minimum in those individuals who develop a minor manifestation from trinitrotoluene damage. With fifty workers, supplemental feeding has been used to advantage, but the number has not been sufficient to draw definite conclusions.

JOURNAL OF AGRICULTURAL AND FOOD CHEMISTRY

Vol. 3, May, 1955

Food for tomorrow. F. J. Weiss.—p. 388.

* Flavor of sebago potatoes grown in soil treated with chlordan, heptachlor, dieldrin, aldrin, or endrin. M. E. Kirkpatrick, G. S. Linton, B. M. Mountjoy, and L. C. Albright.—p. 409.
* Browning methods in microwave cooking. D. A. Copson, B. R. Neumann, and A. L. Brody.—p. 424.
* Storage of pears and apples in the presence of ripened fruit. F. Gerhardt and H. W. Siegelman.—p. 428.

Flavor of Potatoes Grown in Soil Treated with Pesticides. Studies were made of flavor of Sebago potatoes grown in 1952, 1953, and 1954 in soil treated with chlordan, heptachlor, dieldrin, aldrin, or endrin. In the first year's tests, no significant amount of off-flavor was found in potatoes grown in soil treated with chlordan, heptachlor, or dieldrin. The use of a 2-lb. dosage of aldrin in three tests resulted in flavor scores lower than those for other treatments, but significantly low in only one test. In the second year, significant off-odor and off-flavor were present in the case of a 2-lb. dosage of heptachlor on a commercial farm where chlordan, dieldrin, and endrin were applied. At another location in 1953, neither aldrin nor heptachlor caused a significant amount of off-flavor. Treatment of soils with aldrin, heptachlor, or chlordan in 1954 resulted in no injurious effect on flavor when cooked. Off-flavor products may result from unknown contamination of the soil, from a particular insecticide treatment, soil type, location combination, or a variation in the composition of the insecticidal material, even though the same insecticide treatment causes no flavor defects under other environmental conditions.

Browning in Microwave Cooking. Microwave cooking, because of its penetrating nature and minimum generation of environmental heat, yields a product that may differ in appearance, surface texture, and eating characteristics from a product cooked by conventional methods. One such characteristic is the amount of browning of the food surface. A method which utilizes the addition of materials normally found or used in foods to give microwave-cooked foods the characteristic browning of conventional cooked foods with a minimum of cooking time is described.

Storage of Pears and Apples. Pears and apples of commercial maturity, grown in the Pacific Northwest, were stored at various temperatures both in fresh outside air and in the presence of measured quantities of ethylenic and nonethylenic emanations from preripened fruit. At 31°F., there was no difference in the degree of ripeness between the fruit held in fresh outside air and that exposed to emanations from ripe fruit. There was no impairment of cold storage life, texture, flavor, dessert quality, and freedom from physiologic disorders during subsequent ripening. Starking Delicious apples were not affected at 31°, 45°, and 65°F. when stored along with ripened apples of the same variety. Anjou pears were unaffected at 31° and 45°F. in the presence of the emanations from ripened fruit. The respiratory climacteric of the Anjou pears stored with ripened fruit of the same variety was hastened by two days when experiments were conducted at 65°F.

JOURNAL OF THE AMERICAN GERIATRICS SOCIETY

Vol. 3, May, 1955

* Physiologic effects of obesity upon the heart. The incidence of obesity in coronary disease. A. M. Master and H. L. Jaffe.—p. 299.
* The fluid, electrolyte and nutritional management of the elderly surgical patient. E. G. Thomas, T. W. Ledwich, and A. J. Hunnicutt.—p. 311.

Effects of Obesity on Heart Disease. Obese people with heart disease have a much higher mortality rate than do those of average weight or less. Obesity reduces work tolerance and cardiac reserve; it increases oxygen consumption, cardiac work, blood pressure, and cardiac rate. Vital capacity after exercise is diminished. Undernutrition lightens the work of the heart and has been a benefit to those with heart disease. Basal metabolism drops and the vital capacity increases. The introduction of a low-calorie diet in the treatment of coronary disease has lowered the mortality rate in coronary occlusion, and the tendency to anginal pain and congestive failure. Patients who make a complete functional recovery from coronary occlusion or coronary insufficiency present a low incidence of obesity. The frequency of obesity in patients with coronary disease among 1000 consecutive cardiac consultations was ascertained. There was a definite increase in the proportion of overweight in men with angina pectoris or acute coronary insufficiency. In acute coronary occlusion the incidence of overweight was also significantly increased over that in the general population. In female patients, obesity was not more frequent than in the normal population. One possible reason for this finding may be that the women were few in number; also perhaps they were seen after they had lost weight. Although obesity is found more commonly in patients with coronary disease, no statement as to etiologic relationship is possible.

Management of the Elderly Surgical Patient. Methods for physical evaluation and for treatment of the elderly surgical patient are outlined, whereby the replacement of fluid and electrolyte losses may be successfully achieved. The nutritional and hepatic aspects are definitely helpful in appraising and preparing the elderly patient for a major surgical procedure. During this preparatory period, vitamins are given in excess of the daily normal requirements, with a nutritious diet (3000 to 3500 calories) containing approximately 1 gm. protein per pound body weight. Tube feedings are used to achieve these levels, if the patient does not take the food orally.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

Vol. 158, May 21, 1955

Calories in cola drinks. Queries and Minor Notes.—p. 241.

Vol. 158, May 28, 1955

* Nutrition in surgical patients. Council on Foods and Nutrition. J. H. Crandon.—p. 264.

Vol. 158, June 4, 1955

* Cancer and vegetarians. Queries and Minor Notes.—p. 440.
* Wastage of vitamins. Queries and Minor Notes.—p. 440.

Nutrition in Surgical Patients. Nutrition of surgical patients requires consideration of blood and blood volume replacement and water, with and without electrolytes, as well as the utilization of calories, glucose, fat, proteins, vitamins, and minerals. A circulating blood mass adequate in its component parts to compensate for the adjustments of surgical stress is of paramount importance for proper tissue nourishment. With malnourishment, there is generally contracted blood volume. Specific deficits within the vascular bed must be detected and corrected so that proper proportions of red blood cells, protein, and electrolytes are maintained at all times. Judicious adjustment of hydration to existing lean tissue mass is of more value in the pre-operative period than are attempts to produce a positive nitrogen balance, which in most surgical patients is unrealistic until after surgery. In the absence of adequate calories, some portion of protein administered by mouth or vein may nonetheless be utilized for tissue synthesis. Parenterally administered amino acids, although disappointing, may nevertheless be of value both pre-operatively and post-operatively. The advent of reaction-free fat for intravenous administration promises to facilitate the problem of parenteral feeding. Particularly after the early post-operative catabolic phase, every effort must be made to improve the patient's appetite and so balance his diet that oral intake of protein and calories reaches satisfactory levels, as evidenced by weight gain, positive protein balance, and general clinical improvement. The importance of adequate and routine, rather than excessive, doses of ascorbic acid is emphasized, together with the requirements for the B vitamins and vitamin K.

Cancer and Vegetarians. There appears to be no important evidence that vegetarians are less prone to cancer in general than are meat eaters. On the basis of some statistical evidence derived from human beings and experimental

Meat...

and the Prevention and Treatment of Nutritional Edema in Children

Nutritional edema, a state of protein deficiency resulting from inadequate protein consumption, occurs sporadically and has been endemic in areas of the South.[1] A high incidence of hypoproteinemia just above edema levels has been reported in clinic children in a large Southern city.[2] Diets deficient in protein are usually inadequate in other essentials; nutritional hypoproteinemia in many instances may be accompanied by deficiencies in B vitamins and in iron.

To prevent nutritional edema in children, an adequate protein intake must be maintained. To cure the uncomplicated case, the only treatment needed is a high caloric, high protein diet supplying largely protein from animal sources. When the protein in the diet is of this high biologic value, the total quantity of protein required is less than when it is derived chiefly from vegetable sources.[1]

Because of its high content of anabolically effective protein containing all the essential and many other amino acids, meat contributes valuably to the protein adequacy of diets. In addition, generous amounts of meat supply high proportions of the daily allowances of B vitamins and essential minerals—especially iron, phosphorus, and potassium—needed for good nutrition.

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1. Nelson, W. E.: Nutritional Edema (Protein Deficiency, Hypoproteinemia, War Edema), in Nelson, W. E.: Textbook of Pediatrics, ed. 6, Philadelphia, W. B. Saunders Company, 1954, pp. 308-309.
2. Dodd, K., and Minot, A. S.: Edema in Infancy and Childhood as Expression of Chronic Dietary Insufficiency, J. Pediat. *8*:442 (Apr.) 1936; Occurrence of Moderately Reduced Serum Albumin in 500 Children in a Southern Clinic, ibid *8*:452 (Apr.) 1936.

The nutritional statements made in this advertisement have been reviewed and found consistent with current medical opinion by the Council on Foods and Nutrition of the American Medical Association.

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observations, it would appear that the quantity of food in terms of calories is more important in the genesis of cancer than its quality, with the exception of specific deficiencies.

Wastage of Vitamins. The water-soluble vitamins are not stored in the body and are low-threshold substances; if they are present in excess of immediate body need, excretion results. Ascorbic acid is important in wound healing and is needed in adrenal metabolism, but there is no evidence that its administration in patients not deficient is of any value. On the other hand, patients on a diet for ulcers quickly become ascorbic acid-deficient, and older people who do not eat a rounded diet also tend toward deficiency. Administration of B-complex vitamins in large doses sometimes benefits pain of causalgic type but in patients on normal diet does not apparently speed healing of nerve lesions. Here again, patients who are ascorbic acid-deficient also tend to be deficient in B-complex. Post-operatively, in non-depleted patients who can eat, vitamins are not needed. In patients who will have gastric suction from three to four days, replacement is not needed. In patients who have been depleted but have been restored pre-operatively, post-operative administration is not necessary in the first three or four days. It probably is safe to say that vitamins are as much overused as the antibiotics, and it is very difficult to prove that substances used "prophylactically" have been of specific benefit.

THE JOURNAL OF BIOLOGICAL CHEMISTRY

Vol. 213, April, 1955

* The amino acid requirements of man. IX. The phenylalanine requirement. W. C. Rose, B. E. Leach, M. J. Coon, and G. F. Lambert.—p. 913.

Vol. 214, May, 1955

* Amino acid imbalance as related to tryptophan requirement of the rat. H. E. Sauberlich and W. D. Salmon.—p. 463.
* Dietary effects on lipogenesis in adipose tissue. F. X. Hausberger and S. W. Milstein.—p. 483.

Phenylalanine Requirement of Man. A study of six normal young men indicates that the minimal daily L-phenylalanine requirement of man is 1.10 gm. Since other individuals who were not tested may require still larger intakes of L-phenylalanine, provision should be made for this contingency in formulating human diets designed to exclude amino acid deficiencies. Twice the highest observed minimal requirement, or 2.20 gm. daily, would be a safe intake. This, however, is not synonymous with the optimal intake which cannot be measured directly and may be quite high. Experiments upon four individuals reveal that significant amounts of D-phenylalanine can be utilized by the human organism. The inversion of this amino acid appears to be limited to approximately 0.50 gm., or slightly more, per day. For this reason D-phenylalanine is incapable of replacing a sufficient quantity of L-phenylalanine to meet the minimal requirement of man. On the contrary, DL-phenylalanine, when included in the food at a level equal to or slightly in excess of an individual's minimal L-phenylalanine requirement, appears to be almost as effective as the L isomer.

Amino Acid Imbalance and Rat's Tryptophan Need. It appears that the tryptophan requirement of the rat is not a constant factor, but is related to the diet employed and in particular to the protein or nitrogen level of the diet. When oxidized casein or gelatin (proteins devoid of tryptophan) was added to the basal diet, growth depression occurred that could be corrected by supplements of tryptophan. An increase of about 30 per cent in the tryptophan requirement of the rat was needed for comparable growth when the dietary protein was tripled. When the diet contained only 10 per cent protein, the tryptophan requirement was only 0.10 per cent of the diet. In this study, niacin was without effect in correcting the imbalance. The imbalance produced a marked lowering of the plasma level of tryptophan, which was corrected by dietary supplements of tryptophan. The other plasma amino acids did not appear to be affected significantly.

Dietary Effects on Lipogenesis. Utilization of radioglucose by adipose tissue *in vitro* has been investigated under various nutritional conditions. Fasting or feeding of a high-fat diet abolished lipogenesis and greatly diminished glucose oxidation. Pretreatment with insulin had little stimulating effect on glucose utilization in adipose tissue of rats fed a high-fat diet. The rate of lipogenesis from available carbohydrates seemed to be regulated not only by the carbohydrate content of the diet; glucose utilization increased as the carbohydrate content increased or the fat content decreased. The lipogenic activity of the adipose tissue was found to be superior to that of the liver of the same animals.

JOURNAL OF CLINICAL INVESTIGATION

Vol. 34, May, 1955

* Acidification of the urine and increased ammonium excretion without change in acid-base equilibrium: sodium reabsorption as a stimulus to the acidifying process. W. B. Schwartz, R. L. Jenson, and A. S. Relman.—p. 673.
* Digestion of neutral fats by human subjects. R. S. Harris, J. W. Chamberlain, and J. H. Benedict.—p. 685.

Sodium Reabsorption and Urine Acidification. An alkaline infusion of sodium sulphate was administered rapidly to a control group of subjects and to subjects previously stimulated to retain sodium by sodium-free diets, adrenal steroids, or both. Although there were no significant changes in blood *p*H or carbon dioxide content, the urine of the sodium-retaining group became intensely acid, ammonium excretion increased, and there was a striking increase in the excretion of potassium. Despite an equivalent excretion of sulphate, the control group showed no consistent or significant change in urinary *p*H or ammonium excretion and only a small increment in potassium excretion. It is concluded that a stimulus to reabsorb sodium without equivalent amounts of anion will result in acidification of the urine and increased ammonium and potassium excretion. The degree of urine acidity is approximately proportional to the intensity of the stimulus to sodium reabsorption.

Digestion of Neutral Fats. Lipids recovered from the lumen of the intestines of eleven healthy young men were analyzed for the content of free fatty acids, total monoglycerides, and 1-monoglycerides. The level of total monoglyceride ranged up to 13 per cent of the total lipids, and one-half to two-thirds of this was present as 2-monoglyceride. The free fatty acid content was two to three times the total monoglyceride content. Three subjects were fed a breakfast of toast, margarine, jelly, sugar, and coffee. There was no significant difference in the proportion of fat digestion products recovered when fat was fed alone and when incorporated into a meal.

JOURNAL OF HOME ECONOMICS

Vol. 47, May, 1955

* How safe are we at home? E. H. Rogness.—p. 313.

Safety. While written for the homemaker, this article can be directed to food service, too. Safety in the kitchen can be had by watching handles on pots and pans and knobs on the stoves and ovens that can easily be bumped. Floors should be clean and free from water, grease, and slippery substances. Watch for sharp objects and knives. Hot water out of the tap can be too hot. Electrical appliances need the proper connections and dry hands. Hurrying is probably the worst thing of all.

JOURNAL OF NUTRITION

Vol. 55, April, 1955

Antagonism of fresh fat to the toxicity of heated and aerated cottonseed oil. H. Kaunitz, C. A. Slanetz, and R. E. Johnson.—p. 577.

* Observations on the production of smooth-surface rat caries by diets containing skimmilk and whey powders. F. J. McClure and J. E. Folk.—p. 589.
* The relation of age to fat absorption in adult women together with observations on concentration of serum cholesterol. P. Garcia, C. Roderuck, and P. Swanson.—p. 601.
* Nutritional status of the aging. V. Vitamin A and carotene. H. L. Gillum, A. F. Morgan, and F. Sailer.—p. 655.
* Nutritional status of the aging. VI. Serum protein, blood nonprotein nitrogen, uric acid and creatinine. A. F. Morgan, M. Murai, and H. L. Gillum.—p. 671.

Vol. 55, May, 1955

* Effects of malnutrition in early life on subsequent growth and reproduction of rats. M. O. Schultze.—p. 25.
* The relationship between pyridoxine ingestion and transaminase activity. I. Blood hemolysates. M. E. Marsh, L. D. Greenberg, and J. F. Rinehart.—p. 115.
* The relationship of carbohydrate metabolism to protein metabolism. IV. The effect of substituting fat for dietary carbohydrate. W. S. T. Thomson and H. N. Munro.—p. 139.
* Effect of prolonged antibiotic administration on the weight of healthy young males. T. H Haight and W. E. Pierce.—p. 151.
* Metabolism of folic acid and citrovorum factor by human subjects. R. E. Bleiler, D. Johnson, and H T. Parsons.—p. 163.

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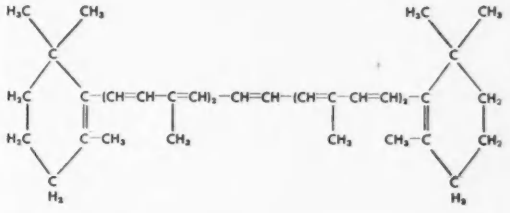

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Milk Powders and Rat Caries. Rats fed diets in which the protein was supplied in the form of three different skim milk powders, developed smooth-surface caries which occurred predominantly on lower buccal areas. The incidence of caries and the average number of teeth affected varied in a manner which paralleled the severity of the heat treatment used in preparation of the milk powders. The most severe cariogenicity was associated with the diet containing a roller-process powder. When the diets were modified by replacing the milk powders with whey powder and vitamin-free casein to provide equivalent protein, the rats developed the same pattern of smooth-surface caries. These results support previous evidence that commercial heat-processing of skim milk powders may aggravate cariogenic effects. The similarity of the experimental rat caries to human smooth-surface caries further justifies interest in the cariogenic potential of commercial, heat-processed foods.

Age and Fat Absorption. An experimental regimen followed by fifty-eight women ranging in age from thirty to ninety years indicated that the maximum number of chylomicrons appearing in the blood after a standard test meal increases with advancing age. The longer the period required to reach a peak count, the greater was the number of chylomicrons in the blood at the time. Concentrations of serum cholesterol increased up to the seventh decade when a decrease was noted. The peak chylomicron count following a high-fat test meal showed the same trend, but no statistically significant relationship was found between serum cholesterol concentrations and the peak chylomicron count. Thus, serum cholesterol may not be related to the pattern of fat absorption.

Vitamin A and Carotene in the Aging. Serum vitamin A and carotene determinations, physical examinations, and seven-day dietary records were obtained from 514 supposedly healthy men and women over fifty years old. Thirty of the men lived in a county home, and the others in their own homes. A small decline in both vitamin A and carotene serum levels occurred with age in both men and women. Nearly half of the subjects had serum vitamin A levels between 40 and 60 mcg. per 100 ml. The serum carotene levels varied more widely, with about 62 per cent falling between 60 and 150 mcg. per 100 ml. The dietary intakes were calculated for preformed vitamin A and for carotene separately and the probable vitamin A equivalent determined. This was found to be 2387 mcg. per day for the men living at home, 1833 for the women, and 1354 for the men in the county home. Twenty-seven per cent of the intake of the men living in their own homes was from carotene, 29 per cent of that of the women, and 18 per cent of that of the men in the county home. About 11 per cent of the men and 20 per cent of the women took vitamin A supplements more or less regularly. When these were included, the average total intakes were 11,470 and 10,200 I.U. daily for the men and women, respectively, living in their own homes and 10,640 and 8,450 when food sources only were used. A slight positive correlation between total vitamin A intake and serum vitamin A level was established.

Serum Protein and Blood Nonprotein in Nitrogen in Aging. The total serum protein levels were determined in 573 men and women over fifty years of age and the nonprotein nitrogen, uric acid, and creatinine levels in the blood of 255 of these. Seven-day dietary records and physical examinations were also recorded. The average serum protein level was 6.47 ± 0.06 mg. per 100 ml. in the men and 6.55 ± 0.05 in the women, with about 90 per cent of all values falling between 6.0 and 7.0. There was no age or sex difference and no correlation with protein intake, although there was some positive relationship to hemoglobin levels. The blood nonprotein nitrogen was greater in the men than in the women, but after seventy years, this difference was not significant. In the men but not in the women the nonprotein nitrogen levels were positively correlated with protein intake. The mean levels were about 40 per cent higher than those usually found in young adults. The blood uric acid levels were also higher in men than women but after seventy years the differences were less marked and the levels decreased. No correlation with the fat intake was found, but a small positive correlation with protein intake in the men but not in the women. The blood creatinine levels were not affected by sex or age. No correlation with protein intake could be detected. The data suggest greater response of the nitrogen metabolism to dietary protein in older men than in women or gradual failure of kidney function which is more marked in the men.

Later Effects of Malnutrition. In rats which were severely inhibited by malnutrition during infancy, later realimentation was unsuccessful in producing normal growth. Many of the male rats reached subnormal stationary weight and were apparently permanently stunted. Female rats, however, showed no impairment in their reproductive performance, and survival and preweaning growth of their young was normal.

Blood Transaminase and Vitamin B_6. Transaminase and vitamin B_6 levels of the blood of monkeys receiving graded doses of pyridoxine hydrochloride and of human beings receiving extra dietary supplements of pyridoxine hydrochloride were studied. In both monkeys and man, increasing the intake of pyridoxine resulted in significant increases in the blood level of both constituents. Reductions in pyridoxine intake were followed by a lowering of the blood concentration of both factors. The changes in the level of transaminase were often more gradual, however, than were those of vitamin B_6. The time required to reduce the levels to a minimum after withdrawal of all pyridoxine or to the initial levels after supplemental dosage was discontinued seemed to depend to some extent on the period of increased intake.

Protein-Sparing by Carbohydrate. Exchange of fat for carbohydrate in protein-containing meals leads to a much greater increase in nitrogen output than occurs after a similar exchange in meals devoid of protein. Thus the main consequence of replacing the carbohydrate of mixed diet by fat is a deterioration in the utilization of dietary protein. The change in nitrogen balance resulting from substitution of fat for carbohydrate is of similar magnitude, whether the fat is fed with the protein of the diet or apart from it. This indicates that the phenomenon is essentially due to removal of carbohydrate from the protein-containing meal and not to an adverse effect of feeding fat with protein.

Effect of Antibiotics on Weight. Three hundred thirty Navy recruits received for seven weeks one of the following: 250 mg. Aureomycin; penicillin, buffered oral, procaine, 100,000 units; or a placebo. Observations on nude weight and height were made initially and again four and seven weeks later. The individual and group weight changes were then calculated, both in pounds and relative body weight. Final data were available on 310 men. A distinct difference between the placebo group and the experimental groups was found. The Aureomycin and penicillin groups were not significantly different. The difference in weight gain between the placebo group (2.7 lb.) and the experimental groups (4.5 lb.) was reflected in roughly equal degree of difference in relative body weight gain, and this would be expected due to chance alone less than 5 per cent of the time. A similar study was conducted without administration of any capsules to determine normal group-to-group variation in this population. No significant differences were encountered.

Human Metabolism of Folic Acid. Citrovorum factor, on the average, accounted for only one-fourth of the total folic acid activity in the urines of four human subjects on a weighed diet containing approximately 25 mg. ascorbic acid and of fifteen subjects on restricted, self-administered diets containing approximately 100 mg. ascorbic acid. Citrovorum factor showed a pronounced but transitory increase in the urine in response to the dose of pteroylglutamic acid; a sharp decline started before folic acid had reached its maximum level of excretion. An excessive daily dose of ascorbic acid (750 mg.) superimposed on the dose of pteroylglutamic acid restored the excretion of citrovorum factor to its previous high level.

THE MEDICAL CLINICS OF NORTH AMERICA

New York Number, May, 1955

Gastrointestinal function in health and disease. C. A. Flood.—p. 699.

* Hepatic function and protein metabolism in cirrhosis of the liver. W. J. Eisenmenger.—p. 719.

* Carbohydrate metabolism. K. L. Pines.—p. 831.

Fat metabolism, obesity, and hypercholesterolemia. M. G. Goldner.—p. 845.

Protein metabolism. H. N. Eisen and M. Tabachnick.—p. 863.

Calcium metabolism in health and disease. C. H. Plimpton.—p. 881.

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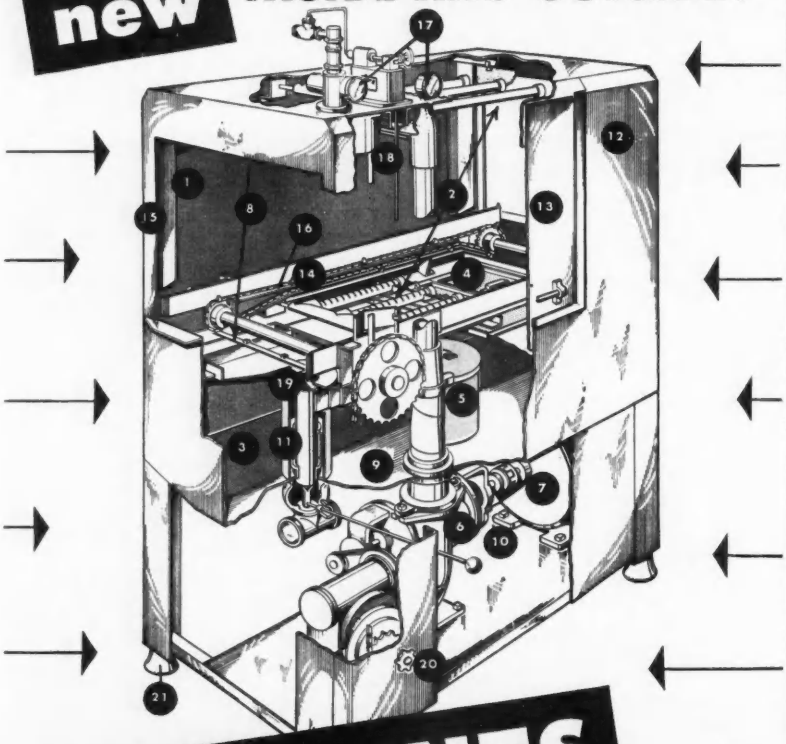

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Protein Metabolism in Cirrhosis. Certain basic abnormalities occur as a consequence of hepatic disease which in turn cause the major clinical and laboratory characteristics of liver disease. Hepatic synthesis of albumin is deficient, while its metabolism is normal. The production rate of plasma gamma globulin is markedly increased and the degradation of this protein is considerably accelerated. Various hepatic function tests are discussed, as well as the factors responsible for the normal retention of water and salt in advanced Laennec's cirrhosis. The author concludes that portal hypertension appears to be an important factor in the production of ascites in Laennec's cirrhosis.

Carbohydrate Metabolism. The metabolism of carbohydrate is discussed in terms of the biochemical reactions of glycolysis and the tricarboxylic acid cycle. The role of the pancreas, pituitary, adrenal, and thyroid glands in the regulation of carbohydrate metabolism is clearly defined. A general consideration of diabetes mellitus, including its diagnosis, treatment, and complications, is presented. Although many questions in the field of carbohydrate metabolism still remain unanswered, recent rapid progress indicates that the solution to fundamental problems is not too far off.

NUTRITION REVIEWS

Vol. 13, May, 1955

* Cultural factors in nutrition. E. Wellin.—p. 129.
* The growth of children on vegetable diets.—p. 131.

Cultural Factors in Nutrition. The service goals of nutritionists, in that they attempt to influence food habits, are thoroughly immersed in culture. Dietary surveys are helped or hindered to the degree that a range of cultural phenomena within the groups studied is taken into account. Culture has at least two quite distinct bearings on experimental nutrition. For one, work with human subjects may be affected by the operation of cultural factors. For the other, ethnographic accounts of a variety of cultures may identify "natural experiments" in nutrition. Culture also appears significant in the epidemiologic study of malnutrition, as exemplified by kwashiorkor.

Growth of Children on Vegetable Diets. It has been shown that diets in which 75 per cent of the calories were derived from wheat flour and 21 per cent from vegetables, and which contained only 8 gm. of animal protein per day, provided undernourished children, ages five to fifteen years, with all of the nutrients required for a high rate of growth and development for a period of eighteen months. No improvement from the inclusion of high extraction flours or enriched flour in place of white flour was evident; and the addition of milk to the diet also failed to improve the rate of gain or general performance. Modern nutritional standards have traditionally included as much as 100 per cent allowance for safety above actual indicated needs. The need for such generous allowances is seriously questioned by this report. Similarly, the supposed inadequacies of

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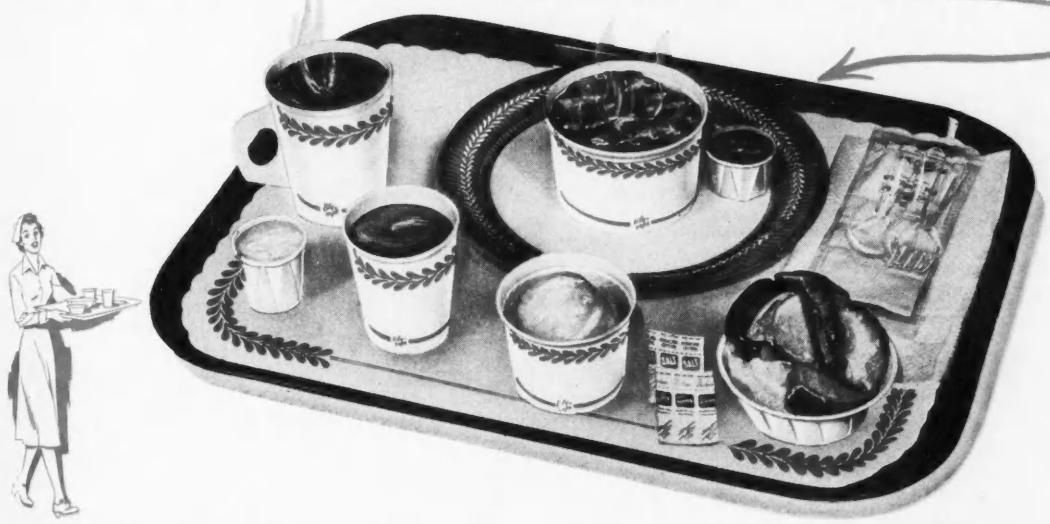

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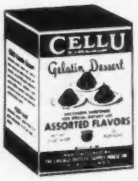

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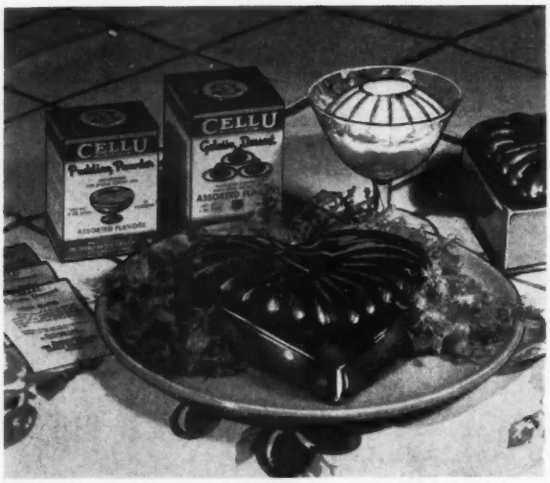

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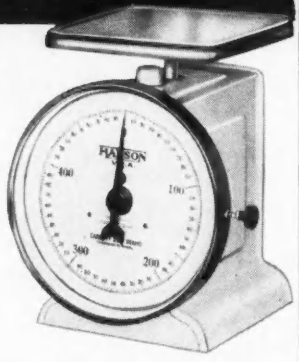

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vegetable protein diets for human beings are not supported by these data. It is apparent that great improvements and perhaps adequate diets are possible under conditions which by most standards would appear inadequate.

PHYSIOLOGICAL REVIEWS

Vol. 35, April, 1955
* Diet and life span. M. Silberberg and R. Silberberg.—p. 347.

Diet and Life Span. Dietary influences may help to prolong life or may increase its hazards and do so by affecting the course of diseases as well as the processes of growth, development, and aging. The role of undernourishment as well as of overnutrition in disease is less controversial than are the relations between dietary regimen on the one hand and growth and life span on the other. In a variety of lower animals, life may be prolonged by restriction of food which results in reduction of body size or of vital activities or of both, to which these species can adjust themselves. However, higher species with their complex organizations are, particularly during growth, less adaptable to drastic food restriction. There can be little doubt about the beneficial effect on longevity of moderate dietary restriction during certain periods of life. The exact age at which restriction should be instituted for optimal effect has yet to be determined. Retardation of growth as such does not seem to contribute materially to longevity just as acceleration of growth as such does not appear to shorten the life span. Growth and longevity may not be mutually interdependent, but rather coordinated phenomena governed by the same metabolic principles. High dietary protein or carbohydrate apparently do not worsen the prospects as to longevity, provided no secondary deficiencies are created, but a high intake of fat, as a rule, has adverse effects on the life span.

SCIENCE

Vol. 121, May 13, 1955
* Demonstration of hemoglobin-reactive substance in human serum. A. H. Tuttle.—p. 701.

Hemoglobin-Reactive Substance in Human Serum. It is indicated that the serum of children and adults ordinarily contains a substance (or substances) capable of altering the electrophoretic mobility of hemoglobin, presumably by molecular interaction resulting in complex formation. This substance is absent in the serum of newborn infants, and according to preliminary observations, it begins to appear during the first few weeks of life. The activity of this substance does not seem to be influenced by the type of hemoglobin present in the serum, for reactions with both fetal and adult hemoglobins have been demonstrated. Qualitative experiments indicate that the concentration of this hemoglobin-reactive substance may undergo alterations in certain diseases; however, the number of determinations carried out to date is not adequate for final interpretation. It is perhaps signifi-

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cant that the interaction of hemoglobin —a compound that is primarily protein in nature—with another substance found in the serum results in a profound change in the electrophoretic characteristics of the hemoglobin. This emphasizes the possibility that characteristic alterations in the electrophoretic pattern of serum proteins seen in certain diseases may be the result, at least in part, of complex formation occurring between normal serum proteins and other substances not ordinarily present in the serum.

ADULT LEADERSHIP

Vol. 4, June, 1955

* Ethics of leadership. T. Brameld.—p. 5.
* Day-by-day training. A. Vinik.—p. 24.

Ethics of Leadership. The leader's responsibility of affecting the interactions and decisions of any group should never be taken lightly. His judgments of right or wrong are bound to influence both the leader's attitude and conduct toward other members of the group, and theirs toward him and each other. One of the highest, and also most neglected, obligations of a leader is to practice the ethics of dealing with people. These ethics of leadership should be in accord with democratic principles and standards. Ethics will be affected by the attitudes of the leaders, because of inner prejudice and personal associations, and it should be remembered that each person in his differences contributes to the group feelings. Leaders should be receptive toward the potentialities of every member of the group. Each should be encouraged to share his resources with all the others. A leader who professes to be democratic is not justified in deliberate manipulation of a group toward his own prejudgment. To avoid this, he should state his own preferences clearly and frankly, at the same time implying that they are continually subject to reconsideration, modification, or even disapproval. Most confusion over leadership results over these three related roles: the "encourager", exemplified by an attitude of equality, with a regard for the varied contributions of all participants; the "pointer" or "suggester" who not only discloses his own partialities, but guarantees that they will be exposed to the richest possible comparison with alternative partialities; and the "implementer" who carries through any decisions that the group has affirmed. There is nothing unethical in performing all of these roles within limits. However, the most democratic leadership is that which distributes leadership.

Day-by-Day Training. Knowledge of social sciences and psychiatry has made it clear that there are no "born leaders," but that all leaders need supervisory training and guidance. This is especially important in the leadership responsibilities of young people. The supervisor may have to help the leader: (a) relate his goals to the goals of the agency; (b) work within existing procedures and administrative limitations; (c) understand the background of the group in relation to its present needs and interests; (d) understand the dynamics of group behavior; (e) understand the behavior of individual group members; (f) understand his relationship to the group; (g) use programs to meet individual and group needs and the objectives of the agency; and (h) use his relationship to the group and its members to influence individual and group behavior. Actually the supervisor is a leader's leader, and he provides a "helping" relationship between the leader and his job. Supervision brings with it past group experience, and the supervisor must be able to understand individuals and their feelings about leadership and their goals, and to help them realize their maximum social, emotional, intellectual, and physical capacities, and to use group experience for the welfare of the whole community.

COLLEGE AND UNIVERSITY BUSINESS

Vol. 18, June, 1955

* Training program for student workers. P. Ensign. —p. 49.

Training Student Workers. Illinois State Normal University initiated a training program for student food service personnel last year. The first food service training workshop, a one-day session, was held the week before school opened. The objectives were to acquaint the student with over-all functioning of food services as related to the residence hall program, to develop a spirit of teamwork and pride of service, and to build a foundation on which excellent food service would continue. Naturally, the workshop had to provide information needed generally by all employees working with food, as well as specific instruction in each particular job. Films and talks by experienced people in the fields of hygiene and food service were features of the workshop. A questionnaire was given to the students so that they might appraise the workshop. The majority agreed that it had been worth while, and most made suggestions for improving the program.

FOOD ENGINEERING

Vol. 27, June, 1955

* Age-old candy problems solved by freezing. J. G. Woodroof.—p. 74.

Candy Problems Solved by Freezing. Problems of the candy industry are lessened by freezing. A study at the Georgia Experiment Station found: (a) advantages and disadvantages of freezind candy; (b) varieties of candy suitable for freezing; and (c) behavior of frozen candies after thawing. Freezing permits manufacturers, when sales are slack, to prepare products to meet special-season demands, such as Christmas and Valentine's Day. Actually, freezing of candy (a) maintains initial quality of product over long periods by curbing staling and development of rancidity; (b) enables more stable production and employment; while (c) improving product quality of some candies, such as marshmallows, divinity, jellies, fudges, and malted milk

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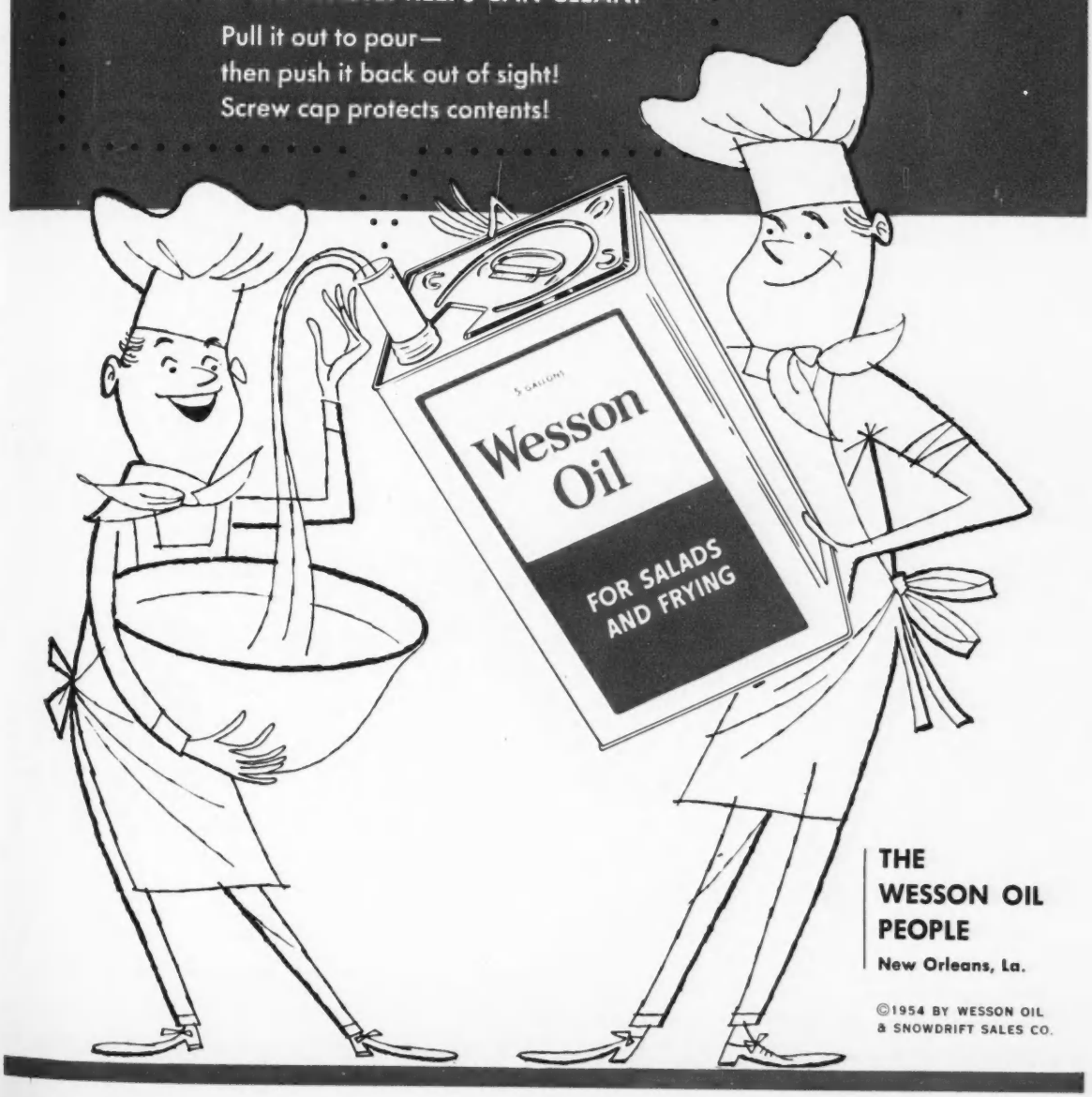

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bars. Those that were harmed by freezing were candies of the spun types, chips, chocolate-coated hard candies and Brazil nuts, and caramels. Freezing may cause a change in texture, but none in color, aroma, or flavor. Also, no detrimental effects of refreezing candies that were allowed to warm up to room temperature were found.

FORECAST FOR HOME ECONOMISTS

Vol. 71, June, 1955

* The spotlight falls on milk. D. I. Elliot.—p. 24.

Milk. The importance of milk as one of the most essential of man's foods cannot be over-emphasized. Milk and its products supply three-fourths of the nation's calcium, nearly half of the riboflavin, and one-fourth of the protein, all at a comparatively low cost. Research in the dairy field, much of it being done by the National Dairy Council which is now celebrating its fortieth anniversary, has played an important part in revealing the true value of milk in the human diet. Scientists, such as Pasteur and De Laval, stimulated perfection in milk processing. Since milk is perishable and easily contaminated, it is guarded at every step from cow to consumer. Once received by the consumer, if proper care is given to it, milk can be kept under refrigeration for several days. However, it must be kept cold—about 40°F.—and covered. Milk is versatile and used in many meal plans, not only as a beverage, but also as part of prepared dishes. The article includes five recipes, given in both small and quantity servings.

HOTEL MANAGEMENT

Vol. 67, May, 1955

How to compute menu prices on a "prime cost" basis. H. H. Pope.—p. 82.

* Simplifying meat and vegetable preparation. A. W. Dana.—p. 89.

Simplifying Meat and Vegetable Preparation. A place for everything and everything in its place is a principle that can be applied to layouts involving butchering and vegetable cleaning in food service kitchens. Intelligent planning visualizes the sequence of these operations, the "before and after" consequences of each part of the job, and their effects on fatigue, safety, convenience, clean-up, and productivity. Containers of vegetables are often temporarily stored on the floor where they are in the worker's way. Keeping the floor clean is difficult due to the inconvenience of having to lift heavy containers and dirt seeping out from the containers. A metal slatted stand with two or three shelves may be used to store rooted vegetables or salad greens. The lowest shelf is high enough from the floor so that cleaning is made convenient. Such a stand is an essential convenience for vegetable cleaning, whether placed at the peeler, sink, or table. Another convenience is a cleaning table with raised and rolled edges and a scrap hole which may be used for waste or for drop delivery of the cleaned vegetables. In a meat cutting section, the work flows from right to left. Thus there should be a table on each side of the meat saw. In grinding meat the revolving bowl cutter is desirable since little or no heat is generated. Nearby space for setting meats and vegetables down before and after processing them, adequate storage space, and portable utility tables will aid substantially in attaining greater productivity by providing greater convenience, reduced hazards and fatigue, and easier clean-up.

INPLANT FOOD MANAGEMENT

Vol. 2, June, 1955

* The lore and lure of coffee. D. Jaffe.—p. 22.

* Glassware meets rough wear.—p. 28.

Coffee. The quality of coffee is often the yardstick by which a cafeteria is measured. Hence, the food service manager should know all he can about coffee preparation and service. The history of coffee is a combination of folk lore and wide-spread popularity of the drink, until today it has become part of everyday life in this country and in Europe as well. The food service manager should buy a blend that will suit his needs from an experienced wholesaler. Next he should install good coffee-brewing equipment and insist that it be handled correctly. This is extremely important, for the best blend, if brewed incorrectly, will not produce good coffee. Urns and urn bags must be kept immaculately clean, measurements must be precise, and temperature must be maintained accurately. The "coffee break" adds problems to the food service manager's coffee problems. The biggest of these are, of course, the problems of serving and of labor. Two popular types of service designed to meet the coffee break rushes are vending machines and stationary canteens.

Glassware to Meet Rough Wear. The cost of broken dishes in an operation can easily run into thousands of dollars annually; often as much as 25 per cent of table stock may have to be replaced in a year. One company has developed a new type of glassware to meet the demand for less expensive dinnerware which can withstand considerable abuse. One establishment, in a three-month period, reported that breakage costs, after using the new ware, dropped from $98.30 to $9.87. This glassware also is stain resistant and does not absorb liquids or odors, even after extended use. White dishes of this glassware are reported not to grow dull, to wash easily, and to be crack-resistant if put in the oven to heat. Initial cost is small, and the extra advantage of strong resistance to breakage lowers replacement costs.

INSTITUTIONS

Vol. 36, June, 1955

* Are profits leaking out the back door? M. E. Leidigh.—p. 7.

* Tips and comments on management IQ. T. Elliott.—p. 45.

* Sanitation responsibilities of food service director. W. H. Haskell.—p. 114.

Summarizes time, motion achievements in institutions. D. E. Lundberg.—p. 126.

What price dishwashing? R. M. Reed.—p. 131.

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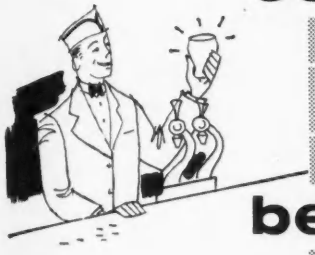

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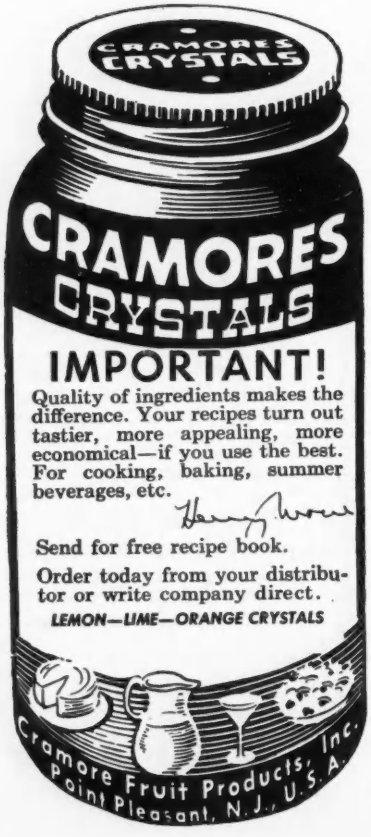
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Cost Control Adds Profit. Unprepared food, which is the equivalent to cash, must be carefully controlled from the time it is delivered until it is prepared. The most important aspects of this control—receiving and storage—are often overlooked. Goods received should be checked by well-trained personnel, and records of all goods should be kept. Employees should be impressed with the fact that the handling of food is as important as the handling of cash. The problem of pilferage, even though a manager likes to trust his employees, often arises. A system for using the oldest stock first should also be devised. Both storage rooms and refrigerators, especially if they are located some distance from the kitchen, should be equipped with locks.

Management IQ. "How about Supervision?" begins a series of informal notes on important issues in institutional operation. Good supervision is the best investment that an institution can make. Often institutional managers who expand their operation, expand everything except supervision and management. The lack of supervision cannot be replaced by years of training, for it eliminates delegated responsibility. Supervisors should be good leaders and know their job, and what they are supervising, thoroughly. Managers will often pride themselves on working 12 to 16 hr. a day, thus eliminating the need for supervision. However, good and enthusiastic management requires ample rest, recreation, good health, and a little time to think and plan. Six helpful rules of correct supervision for the manager are: (a) learn to expand management and supervision before you expand anything else; (b) learn how to select good supervisors—those with leadership capabilities; (c) learn how to delegate responsibility and commensurate authority and follow up with proper control; (d) learn how to supervise supervisors; (e) realize that supervisors must be trained in supervision, just as a cook must be trained in cooking; and (f) learn how to budget time for planning and evaluating results.

Sanitation Responsibilities. For all types of food service operations, the director occupies a position of great responsibility; he has within his power the possibilities of providing an efficient organization, a haphazardly run establishment, or a feeding operation so conducted that it eventually falls into disrepute. The top executive, in order to avoid undesirable situations, should not only be fully aware of the science of sanitation, but also be personally convinced of its importance. There are courses in sanitation given through various organizations. Meetings of federal, state, and local sanitation agencies, where subjects of vital importance are discussed, should be attended. Attendance at educational meetings for food service personnel is a necessity often overlooked by directors of food service. However, the instruction must be good, for poor instruction does more harm than none at all. It is a good idea to hold informal routine staff meetings on sanitation. It shouldn't be felt that there is a lack of sanitation because of these meetings; instead they serve to make the whole organization sanitation conscious. Subscriptions to magazines dealing with sanitation will help an organization follow the most modern sanitation methods. Regular inspection by official agencies should be conducted to determine any defects in operation and to assist in maintaining the sanitation requirements at a high level.

THE MODERN HOSPITAL

Vol. 84, June, 1955

* Every hospital's hottest problem—coffee. E. T. Farnsworth.—p. 120.

Hospital's Coffee Problem. Four experiments were made at the New England Center Hospital, Boston, to determine what "acceptably hot" coffee is. It was found that the general average of "acceptable drinking hotness" in coffee was 149°F. Adding sugar and cream brings the temperature down 12°F., which means that coffee must be 161°F. when the patient pours it into his cup. Of the six commonly used coffee serving containers, the stainless metal vacuum jug was found to be the only one which would preserve temperature of coffee at an acceptable level for a period of 20 min., the average time from urn to drinking. In all of the containers, it was found that the largest heat loss occurred within the first 5 min., and for each succeeding 5 min. period, heat left the containers at a much slower and more even rate. Loss of time in getting coffee to the patient in an acceptably hot condition was greatest not in carrying distance from kitchen to patient, but in waiting for trays to be served after the coffee was placed on the tray and the interval between the time the patient received the coffee and drank it.

PERSONNEL JOURNAL

Vol. 34, June, 1955

* Six changes that affect supervisors' job planning. L. R. Clark.—p. 46.

Changes in Job Planning. A supervisor will make better progress personally and do a better job if he plans his work from an analysis of his own particular position, than if he simply performs his day-to-day work in a routine way. There are six relatively new conditions, or factors, which exist in the average supervisor's job. (a) The scope of the supervisor's duties has been reduced and is more concentrated in its reduced area. (b) The worker is no longer pushed, he is led; he is no longer threatened, but is convinced; he is not discharged, but subjected to helpful discipline. (c) The foreman as a supervisor is no longer "the management" in the eyes of the worker. (d) The worker no longer depends on his foreman for his security. (e) The worker's problems are no longer exclusively individual, but in many plants, union problems to a certain degree. (f) The management-union relationship has to some extent damaged the worker-supervisor relationship. All of these factors add up to a new type of attitude and behavior in the worker.

If your special diet patient tables your food specifications . . .

most likely mealtime has become a distasteful chore instead of a delightful duty. You can often encourage a stubborn eater to stay with your diet by offering wider food variety—more palatable menus. Gerber's 4 Cereals, over 60 Strained and Junior (minced) Foods give you greater latitude in making substitutions for "picky" eaters. Specially processed to preserve true colors and tempting flavors—reduce crude fiber to a minimum.

GOOD SUBJECT MATTER FOR YOU AND YOUR PATIENTS

New ways to brighten bland diets—Gerber's "Special Diet Recipes"—over 96 easy-to-fix dishes, properly indexed for Bland, Soft, Mechanically Soft, Liquid and Low-Residue diets. For free copies, write on your letterhead to Dept. 238-5 Fremont, Michigan.

Gerber®

CEREALS, STRAINED & JUNIOR FOODS

Briefs on the 38th Annual Meeting

St. Louis—October 18–21, 1955

Fragments of news about coming events in St. Louis promise a good deal in the way of fun and interest. The week will be opened officially and cheerfully on Monday evening at a gathering in the ballroom of the Hotel Statler. The officers of the Association will receive their guests—all of the exhibitors and the members.

Ideas designed to give everyone a good time are still being tossed about. Definite enough for publication is the word that a five-piece orchestra will furnish music throughout the evening, a Negro quintet will sing river songs, and a German *lieder* singer will entertain. Details will reach you later.

TRIPS IN STORE FOR YOU

Barnes Hospital, which includes Barnes, McMillan, St. Louis Maternity, Wohl, Renard, and Barnard Free Skin and Cancer Hospital, is scheduled for a tour.

You will see the remodeled main kitchen of Barnes and its hospital airline food service. The facilities of the dietary department of the new Wohl Hospital will be included in the itinerary.

Many new things of interest will be viewed on a tour of the University of Missouri at Columbia. A visit to a new food and agricultural research laboratory will include an explanation of research in human nutrition by Dr. Ernestine Frazier of the Home Economics Department. Equipment will be demonstrated.

Also on the agenda at Columbia are many new residence halls—including a residence for over 300 freshman women and a men's residence hall serving as many as 1400 men: the new student union which includes a cafeteria, a grillroom, and a banquet and catering service; and an opportunity to see slides of blue prints of the food services planned in the new medical center and hospital now under construction.

Trips to the new VA Cochran Hospital and the Southern Equipment Company definitely have been planned. Under serious consideration are visits to a large industrial cafeteria; the new wholesale fruit and vegetable market; and an inspiring list of other locations.

WORLD'S ONLY 5-STORY CAVERN

Completely on your own, you may wish to stop off at Stanton, Missouri, just 55 mi. southwest of St. Louis, to see the Meramec Caverns, listed as the ninth wonder of the world. A conducted tour every 20 min. will take you to five distinct floor levels of variations in cave scenery.

Unusual onyx formations—the largest known stalagmites, ragonite, and stalactites are among the wonders to be viewed. The oldest and largest formation of its kind, the earth's natural stage curtains offer another spectacular sight. They are lighted with sixty-two different illuminating effects to reveal their beauty.

These are the only caverns in the country in which concrete walks are provided for the comfort of the visitor. Bus service is provided from Stanton.

ON DISPLAY FOR YOU

Why not adopt the attitude of the "Show Me" state and let the many fine exhibitors at Kiel Auditorium show *you* their products? Commercial companies from all over the U. S. will send their representatives who look forward to discussing their services with you.

What a convenient way to "comparison shop" when you can see so many different products all under one roof! And this year, intermissions are scheduled Tuesday through Thursday to allow you even more time to collect information which will be of value to you throughout the year.

In welcoming the A.D.A. to its home town, *Magic Chef, Inc.* will feature advanced engineering, functional design, super-strong construction in a new line of Super Duty gas ranges, broilers, bake ovens and fryers.

Calling itself the "Health Food of America," *Dennis Water Cress, Inc.* invites you to stop at its booth for your copy of a fine collection of recipes and to chat a while.

Fearn Foods, Inc. promises to give you hints about the multitude of uses for Le Gout Chicken Base and its other products when you visit its booth.

The new Naco HCP portable electric food cart will be demonstrated at the *National Cornice Works* booth. Available in standard and deluxe stainless steel finishes, it stores almost 50 per cent more than previous models.

The Lemon Products Advisory Board will tell you about Lemon Juice Concentrate Frozen, a new and versatile product produced by the California Lemon Industry.

Featured at the *Knox Gelatine* display will be new weight reduction and diabetic diets embodying the use of the Food Exchange lists developed by the U. S. Public Health Service, the A.D.A., and the American Diabetes Association. Various other materials on modified diets will also be available.

The Diamond Crystal Salt Co. informs us that over 1500 hospitals are now using Diamond Crystal Salt and Pepper Packets. Its representative will be glad to discuss the advantages of these packets with you.

For your approval, the *J. B. Lippincott Co.* will present a display of professional books and journals geared to the latest important trends.

Be sure to stop at the *Pet Milk Co.* booth to taste samples of Instant Pet Nonfat Dry Milk. The exhibit will also feature educational publications illustrating the use of Pet Evaporated Milk and Instant Pet Nonfat Dry Milk in meal planning and food preparation.

Stanley Equipment Division of Landers Frary and Clark will have its complete line of all-metal beverage servers, jugs, and bowls on display.

Jovial Aunt Jemima will be on hand to serve you pancakes at the *Quaker Oats Co.* booth. A revised "Vitamin Summary and Nutrition Review," quantity recipes, and a helpful menu planner will be featured.

The Cereal Institute, Inc. exhibit will include the twenty scientific papers which have been published on the Iowa Breakfast Studies. Representatives will discuss with you the September National Better Breakfast Program sponsored by the *Institute*.

Enjoy a Meritene milk shake with its multiple nutritive values at the *Dietene Co.* booth. While you're there, review the Dietene diet based on Dietene Reducing Supplement.

The National Biscuit Co. would like to help you with meal planning at its exhibit. See the individual service varieties which offer portion control with no waste.

Eli Lilly & Co. will present an exhibit concerned with the treatment of diabetes and the dietitian's role in the treatment of diabetic patients.

Toastmaster has two products you will want to study—the all-new Toastmaster Powermatic Toaster which takes the bread right out of your fingers, toasts it, and serves it back, and the Toastmaster De Luxe Hot-Food Server.

When you stop at the *G. S. Blakeslee & Co.* booth, be sure to wish the representatives a "happy anniversary," for 1955 is the 75th year for this company which will exhibit a completely new series of dishwashing machines.

Pick up free copies of three colorful brochures at the *National Association of Margarine Manufacturers* display.

A dishwashing machine rack for coffee pots and thermos with hinged cover will be exhibited by *Metropolitan Wire Goods Corporation*.

ALUMNAE MEALS

The Alumnae Meals Committee will be pleased to make arrangements for mealtime reunions of college alumnae and dietetic internship groups. The reunions are scheduled as follows:

Tuesday evening, October 18—college alumnae
Wednesday breakfast, October 19—dietetic internships
Thursday evening, October 20—dietetic internships
Friday breakfast, October 21—college alumnae

The name of the group, its chairman, and the approximate number expected should be sent to:

Miss Henrietta Becker
Director of Dietetics
Barnes Hospital
St. Louis 10, Missouri

No reservations will be accepted after September 10.

Watch this page each month for Annual Meeting news.

Application for Housing Accommodations

THE AMERICAN DIETETIC ASSOCIATION

St. Louis, Mo. • October 18–21, 1955

For your convenience in making hotel reservations for the coming meeting of THE AMERICAN DIETETIC ASSOCIATION on October 18–21, 1955 in St. Louis, hotels and their rates are listed below. Use the form at the bottom of this page, indicating your first, second and third choice. Because of the limited number of single rooms available, you will stand a much better chance of securing accommodations of your choice if your request calls for rooms to be occupied by two or more persons. All reservations must be cleared through the Housing Bureau. ALL REQUESTS FOR RESERVATIONS MUST GIVE DEFINITE DATE AND HOUR OF ARRIVAL AS WELL AS DEFINITE DATE AND APPROXIMATE HOUR OF DEPARTURE, ALSO NAMES AND ADDRESSES OF ALL PERSONS WHO WILL OCCUPY RESERVATIONS REQUESTED *MUST* BE INCLUDED.

Hotel	For one person	For two persons		2-Room Suites
		Double Bed	Twin Beds	Parlor & Bedroom
JEFFERSON*	6.00– 9.00	9.00–12.00	11.00–15.50	25.00–39.50
LENNOX	5.00–10.00	6.50–10.50	10.00–12.50	18.00 & Up
MARK TWAIN	4.00– 7.50	5.50– 9.00	8.00– 9.00	12.50 & Up
MAYFAIR	5.00–10.00	6.50–12.00	8.50–12.00	14.50 & Up
STATLER	5.00–11.00	7.50–14.00	9.00–18.00	30.50–32.00

In the event that the hotel room rate structure is changed prior to the above convention these rates will be changed accordingly. (See map on page 530—May issue)

* Headquarters

ALL RESERVATIONS MUST BE RECEIVED PRIOR TO: September 18, 1955

Hotels Convention Reservation Bureau, A.D.A.
Room 406—911 Locust St.
St. Louis 1, Mo.

Please reserve the following accommodations for: THE AMERICAN DIETETIC ASSOCIATION Convention in St. Louis, Missouri on October 18–21, 1955

Single Room.....Double Bedded Room.....Twin Bedded Room.....
2 Room Suite.....Other Type of Room.....
Rate: From $.....to $.....

First Choice Hotel.....
Second Choice Hotel.....
Third Choice Hotel.....

Arriving at Hotel (date).....hour.....A. M.....P. M. Leaving (date).....hour.....A. M.....P. M.

THE NAME OF EACH HOTEL GUEST MUST BE LISTED. Therefore, please include the names of *both* persons for *each* double room or twin bedded room requested. Names and addresses of all persons for whom you are requesting reservations and who will occupy the rooms asked for:

.....
.....
.....
.....

(Individual Requesting Reservations)
Name.....

Address.....

City and State.....

If the hotels of your choice are unable to accept your reservation the Hotels Convention Reservation Bureau will make as good a reservation as possible elsewhere provided all hotel rooms available have not already been taken.

News Notes

Advisory Committee for U.S.D.A. Late in June, the U. S. Department of Agriculture announced the appointment of a fifteen-member advisory committee for home economics research. The committee will review the Department's current research program in home economics—including food and nutrition, textiles and clothing, housing and household equipment, and family economics. It will also make recommendations on future research programs. The membership includes homemakers; persons responsible for Extension and school teaching of home economics; leaders associated with industry, women's magazines, social service, and public affairs; and university teachers, researchers, and administrators concerned with home economics. Dr. Barnard D. Joy, Assistant to the Administrator for Committee Operations of the Agricultural Research Service, will serve as Executive Secretary of the committee.

International Congress for Dietetics. Rome will be the site of a meeting of the International Interim Committee of Dietetics to be held August 20 to September 4 in order to complete plans for the Second International Congress for Dietetics to be held in Rome next year (September 10–14, 1956). Representatives from the Netherlands, Sweden, Great Britain, Italy, and the U.S. will attend.

Special consideration will be given to the planning of the program for the Second International Congress. We, in the U.S., are interested and anxious that members of A.D.A. participate in the program. Talks on administrative problems, as well as diet therapy and research, are needed. If you plan to attend, please send your suggestions to the Headquarters office. A 250-word abstract of your talk should be submitted, which will be used in the selection of speakers. This selection will be made promptly so that if your travel request depends on participation in the program, you will have ample time to plan your European trip.

Borden Award. Dr. Pearl P. Swanson, Professor of Foods and Nutrition, Iowa State College, Ames, was named the Borden Award winner for 1955 on June 29 at the annual meeting of the *American Home Economics Association* in Minneapolis. The committee's citation stated that Dr. Swanson was selected because of her "direct contributions to the organization and status of research in home economics departments, and to the training of research workers as well as her own very fundamental studies of basic problems in nutrition." The committee also pointed out that Dr. Swanson's publications cover a wide variety of subjects, including metabolism of proteins, dietary requirements for reproduction, nutritional status of population groups, the role of inorganic salts in nutrition, and problems of fat and lipid metabolism in women. Dr. Swanson is also Assistant Director of the Iowa State Experiment Station in charge of home economics research.

Sanitation Foundation's Program Cited. At its annual meeting in Chicago in May, the Food Service Equipment Industry presented the National Sanitation Foundation with a special Award of Merit. The Award, in the form of a handsome plaque, was accepted by Walter F. Snyder, Executive Director of the Foundation. The citation read: "In recognition of outstanding service in the development of sanitation and construction standards of food service equipment, and of ever continuing efforts to simplify and standardize public health and sanitation codes, and to encourage cooperation between our industry, sanitarians and public health officials, this Award of Merit is presented to the National Sanitation Foundation by order of the Board of Directors of the Food Service Equipment Industry, Inc."

Plentiful Foods MONTHLY LIST

The U.S. Department of Agriculture has announced the following list of foods expected to be in plentiful supply during August:

Features
Chickens—broilers and fryers
Grapefruit—canned sections

Protein foods
Beef
Halibut—fresh and frozen
Milk and other dairy products

Other foods
Grapes, fresh
Lard
Lemons—fresh and processed
Limes—fresh and processed
Potatoes
Rice
Vegetable fats and oils
Vegetables, summer
Watermelons

WHO News. Three consultants of the World Health Organization of the United Nations have reported, after a survey of nutrition in Egypt, that anemia is the cause of more ill health in that country than pellagra. This may be attributed to the prevalence of parasitic infections. In visiting towns, villages, schools, hospitals, out-patient clinics, and maternal and child health centers during one of the seasonal peak periods of the incidence of nutritional diseases, the consultants found only one case of pellagra in the schools surveyed, although in endemic disease hospitals and out-patient departments, pellagra was present in about 20 per cent of the new cases. It is most prevalent in areas where maize is the chief cereal eaten, although it was encountered in almost all sections, with an over-all incidence averaging 0.5 per cent.

Anemia, however, is prevalent among both wheat- and maize-eating populations. The groups most affected are pregnant women and children in the ages between weaning and puberty.

The consultants recommended that maize be enriched with niacin and iron at the village mills or that the government subsidize the exchange of village maize for wheat enriched with iron. As part of its continuing aid in the improvement of nutrition in Egypt, WHO will provide a consultant to help the government in planning a nutrition institute.

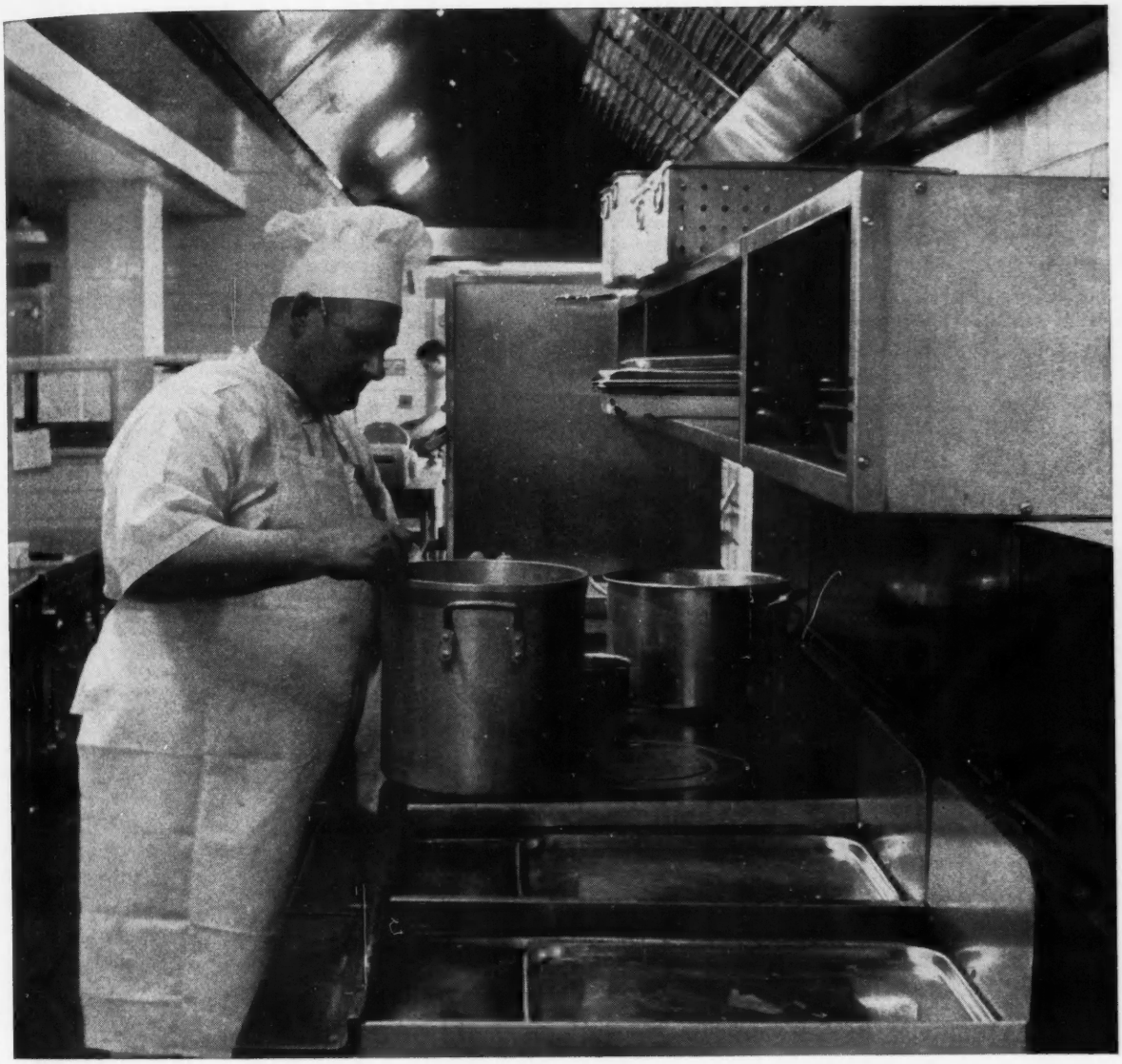
Weight Control Publication. Proceedings of the Weight Control Colloquium held at Iowa State College early this year have now been published under the title *Weight Control*. Abstracts of the various speeches and papers, which are included in their entirety in this publication, have appeared in several recent issues of this JOURNAL. The 244-page report may be obtained from the Iowa State College Press at $2.50 a copy.

Dr. Clifcorn Heads Food Technologists. Dr. La Verne E. Clifcorn recently appointed Research Associate, Research Division, American Can Company, Barrington, Illinois, has been elected the 1955–56 President of the Institute of Food Technologists.

New A.H.E.A. Officers. At the annual meeting of the American Home Economics Association in Minneapolis, Dr. Beulah V. Gillaspie, Dean, School of Home Economics, Purdue University, Lafayette, Indiana, was elected President-Elect for the year 1955–56, taking office as President for a two-year term in 1956. Other officers elected at the meeting are: Vice-President, Irene E. McDermott, Director of Home Economics Education, Pittsburgh; and Recording Secretary, Nellie S. Buckey, Supervisor of Home Economics Education, Baltimore. Newly elected officers of the fifteen different sections of A.H.E.A., and of the nominating committee were also announced at the meeting.

Interns Graduate. On July 14, thirteen dietetic interns completed their year's work at the VA Hospital, Bronx, New York. The graduates are:

Mary Brady, Notre Dame College, Cleveland
Ann Cummins, Siena Heights College, Adrian, Michigan
Geraldine Gulcynsky, University of Wisconsin, Madison
Ann Hankinson, Immaculata College, Philadelphia
Amelia Hitt, University of Georgia, Athens
Barbara Hyland, Purdue University, Lafayette, Indiana
Shirley Laycock, Massachusetts State Teachers College, Framingham
Helen Lukesh, College of Misericordia, Dallas, Pennsylvania



"We like the way *GAS* meets fluctuating demands"

— *Boston's Carney Hospital*

Hospital supervisors, and Michael Kenney, chef, at Boston's Carney Hospital, are more than satisfied with their new Gas equipment.

"Gas provides the speed we need for our type operation. The heat is easily controlled, and the overall economy of operation and the low maintenance cost have more than justified our choice of Gas equipment. The ability to meet rapidly fluctuating demands together with the complete dependability of Gas has also contributed to our satisfaction with our present equipment."

The Gas equipment at Carney includes 2 fryers, 3 ranges, a broiler and a double section roast oven . . . all Vulcan. The kitchen is planned to feed 1000 patients and hospital personnel when operating at full capacity.

Carney Hospital has found Gas equipment efficient and dependable. In hospital after hospital from coast to coast, you'll find Gas providing similar results. If you're planning a new kitchen or remodeling or expanding your present one, call your Gas Company Commercial Specialist and discuss the economies and results modern Gas equipment provides. *American Gas Association.*

Jacqueline Schutz, College of St. Catherine, St. Paul
Carole Shapiro, Western Reserve University, Cleveland
Dana Parducci, Mundelein College, Chicago
Adele Ryba, Marywood College, Scranton, Pennsylvania
Isabel Sweetman, College of St. Elizabeth, Convent Station, New Jersey

A.H.A. Convention. "Working Together for Better Health" will be the theme of the American Hospital Association convention in Atlantic City, September 19 through 22. This year's convention will feature 100 round table sessions on a variety of pertinent subjects.

Coffee Drinking Habits in the U.S. A survey by the Pan-American Coffee Bureau indicates that although coffee-drinking in the U.S. increased last year, the number of daily cups per person consumed in eating places dropped considerably, i.e., from 0.32 cups per person on a typical winter day in 1954 to 0.25 cups in 1955. However, daily consumption in the home increased about 6 per cent from 2.10 cups per person per day in 1954 to 2.23 cups in 1955. This is slightly more than the over-all average increase in consumption of 2 per cent.

The decline in coffee-drinking in restaurants and public eating places was general, occurring in large restaurants and cafeterias as well as in smaller places, such as roadside stands. There was a drop of 25 per cent in dinner coffee-drinking and 50 per cent at lunch, breakfast being the only meal at which intake was increased. The only age group which increased its use of coffee was that from twenty to twenty-four years the greatest decline occurring in people over forty.

The survey showed, however, that 65 per cent of U.S. workers now have a daily coffee break, and that the amount of coffee consumed on the job has almost doubled in the past five years. Of the employed persons interviewed, 45 per cent said that coffee was available on the premises, and an additional 20 per cent said they were free to go outside for it or could stop while traveling on the job. Factory employees consumed more coffee on the job than other groups, although store employees ran them a close second, with office workers third, and workers who travel or are employed primarily out-of-doors last.

Gold Coast Studies Available. Faye Woodard Grant's study of "Nutrition and Health of Gold Coast Children" which appeared in the July issue of this JOURNAL, was supported in part by a grant from the Dr. Wallace C. and Clara A. Abbott Memorial Fund of the University of Chicago. A monograph presenting the full report and tabular materials of this study may be ordered from the University of Chicago Bookstore, 5802 Ellis Avenue, Chicago 37, for $2.00, including postage.

Freezing Cheese. At the Minnesota Agricultural Experiment Station, ten varieties of cheese have been successfully frozen for home use. Success depends on rapid freezing as well as the composition of the cheese. The freezer should be 0°F. or lower, and the pieces or packages of cheese should weigh no more than 1 lb. Larger pieces, i.e., 5-lb. wedges, became chalky in appearance when frozen, and when thawed, became crumbly and fell to pieces when sliced. The varieties of cheese that were frozen and kept in freezer storage for six months successfully included: Cheddar, brick, Port du Salut, Swiss, Provoloni, Mozzarella, Liederkranz, Camembert, Parmesan, and Romano. Three brands of blue cheese all became crumbly and mealy after freezing, but if it is to be used for salads or dressings, the crumbliness would actually make the cheese easier to handle. Cream cheese, on freezing, became watery and mealy, and it is not recommended for freezing.

Don't Wash Rice. Nutritionists of the Georgia and South Carolina Experiment Stations recommend that rice not be washed before cooking and that it should not be drained or rinsed afterwards. Rice found in grocery stores today has been processed so it needs no washing, and washing causes losses as high as 43 per cent of the thiamine naturally present. Also, washing tends to make rice sticky or gummy rather than fluffy, tender, and in separate grains. Draining or rinsing is also wasteful of natural or added nutrients. The secret is using the proper proportions of

2 compartment, Steam-Chef Gas, electric or direct steam.

Cafeteria Pan Steamer, cooks food in Service pans.

"We like our STEAM-CHEF

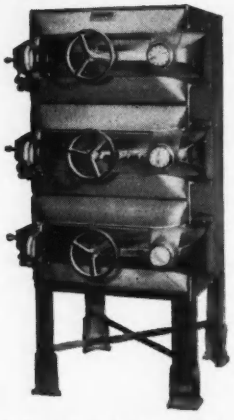
Our work is much easier, we cook in less time and we have no fear of burning or scorching big quantities of food. We simply could not operate without it."

The manager of the Darlington School cafeteria in Darlington, South Carolina, points out the advantages of steam cooking.

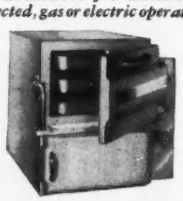
Schools, restaurants, hospitals, institutions and hotels are discovering that these steaming features make food more attractive and nutritious.

Steam-Chef and Steamcraft cooking saves costly food losses by reducing shrinkage and leftovers. They assure freshly-cooked, appetizing food at all times by making frequent small-lot cooking practical. "Pot-watching" and scouring are eliminated.

For complete details on how you can benefit from the advantages of cooking with steam, write to:



3 Compartment Steam-Chef *is available for direct connected, gas or electric operation.*



Steamcraft for smaller installations is available in floor or counter-top models.

THE CLEVELAND RANGE COMPANY
"The Steamer People"
3333-D LAKESIDE AVENUE • CLEVELAND 14, OHIO

Contented guests

Having savored a serving of a Sexton preserve or jelly, it is not unusual for a guest to comment on it—even to ask where it may be obtained. No thin, syrupy mixture this but the fullbodied essence of the plump, ripe fruit, blended only with crystal cane sugar cooked to an elegant consistency. A trial assortment from the great variety of Sexton jams, jellies, and marmalades and fruit butters will be an education in how so seemingly small a detail can mean so much in guest contentment.

Friendship House, Mississippi City, Miss.

Sexton Quality Foods

JOHN SEXTON & CO., CHICAGO, 1955

rice and water so that the rice can absorb all the water.

These nutritionists especially recommend cooking rice in a steamer or baking in a tightly covered dish.

News of State Associations

Arkansas Dietetic Association. On May 23 and 24, the Arkansas Dietetic Association met with the Arkansas Hospital Association in Little Rock. Speakers for the dietetic group included Erick Franken who discussed "Footwear and Professional Efficiency," and Ernestine Camp, School Lunch Supervisor for Northwest Arkansas, who described the program in her part of the state. A.D.A. representative, Doris Odle, spoke on "Trends in Serving Modified Diets in Small Hospitals and Related Institutions." Miss Odle also appeared on two panels which were part of the program of the hospital meeting; at one the topic was training of personnel, while the other was a "problem" clinic.

Colorado Dietetic Association. At its spring meeting, the Colorado Dietetic Association entertained five prospective dietetic interns as special guests. Principal speaker of the meeting was Dr. E. Paul Sheridan, Denver General Hospital, who spoke on "Diabetes in the Elderly Patient." This was followed by a discussion by Carla Nelson and Noreen Morgan, dietetic interns at Colorado State Hospital, Pueblo, and Colorado General Hospital, respectively, of the diabetic exchange system. Miss Morgan presented a Spanish translation of the Exchange Lists which has been prepared by Johanna Gates. The four section chairmen for Colorado also conducted small conference groups leading discussions on the projects and the functions of the Sections.

The Colorado Association voted to honor the late Louise Poley by naming the Colorado Scholarship Fund, the "Louise Poley Scholarship Award."

New officers elected to serve in 1955–56 will be: President-Elect, Dorothy Scott, Children's Hospital, Denver; and Secretary, Betty Newman, Denver General Hospital.

District of Columbia Dietetic Association. The 1954–55 program of the District of Columbia Dietetic Association began with an open meeting held in November in conjunction with the Maryland, District of Columbia, and Delaware Hospital Associations. "Methods for Standardization in Food Production," was discussed by Sarah Grimes Wildman, of the government's General Services Administration. Another subject of the meeting was "New Knowledge of Heart Disease and Its Relation to Nutrition" by Dr. Luther Terry, National Heart Institute, Bethesda. Ernestine B. McCollum, Johns Hopkins University, also spoke on "What Shall We Tell the Public About Food?"

In January, Dr. Linus Zink, Assistant Chief Medical Director, Veterans Administration, talked on "The Dietitian as an Executive." In March, the program featured the theme of "Educating Ourselves," which involved discussions by many members on such subjects as low-sodium diets, weight guidance, and food supplements. For the final meeting of the year in May, Andromache Sismanidis, Nutrition Representative, Food and Agriculture Organization, spoke on "Nutrition Work at the International Level."

Hawaii Dietetic Association. On June 16 and 17, the Hawaii Dietetic Association sponsored its first "Refresher Workshop." Two speakers, followed by discussion periods, highlighted each afternoon's program. The program included:

"Personnel Policies"—Edward C. Gallas, Manager, Research Associates
"Purchasing and Marketing"—Col. Edward S. Ehlen, Quartermaster Corps, U. S. Army
"Radioactive Isotopes"—Dr. Jun Chuan Wang, Associate Director of Radiology, Queen's Hospital
"Dental Health in Hawaii"—Dr. Leonora Bilger, Professor of Chemistry, University of Hawaii

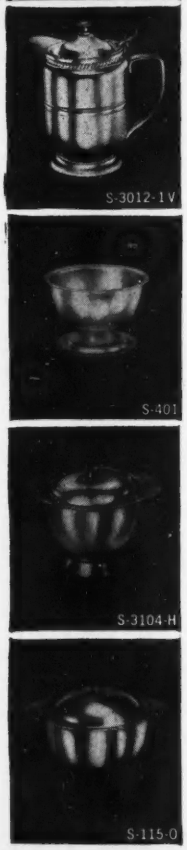
Officers for 1955–56 of the Hawaii Dietetic Association will be: President, Boletha Frojen, University of Hawaii, Honolulu; President-Elect, Virginia Cooksey, Wahiawa; Treasurer, Sayako Oumaye, Honolulu; and Secretary, Jane Kumada, Honolulu.

Gleaming stainless steel tray service... perfect for hospital use!

Legion's new attractive hospital service is seamless drawn 18-8 stainless steel. No cracks or corners to catch dirt—easy to clean and sterilize. They are unbreakable, non-porous, need no refinishing or replating. Lustrous platinum finish with attractive border decorations.* *No tax.*

S-114-O	Oval Vegetable Dish	S-3012-IV	Vacuum Jug
S-115-AO	Round Vegetable Dish	S-401	Low Sundae Cup
3012-VA	Vacuum Pitcher	S-3104-H	Soup Tureen
S-1509-3	Plate Cover	S-115-O	Round Casserole

See Price List #9



Write for catalogues:
LEGION UTENSILS CO., 2109 40th Avenue
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21 East Van Buren Street, Chicago, Ill.
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We knew Uncle Ben's would cook fluffy every time. But we wanted *proof* that extra fluffiness meant more servings, bigger servings, bigger *savings* per pound.

So the restaurant experts took over. They compared Uncle Ben's with four other leading brands. Each brand was cooked according to directions under actual restaurant conditions.

The results? You can see from the picture. Uncle Ben's extra fluffiness gives you more cooked rice per pound than other leading brands. That's mighty profitable news for you!

And there's more. Uncle Ben's cooks fluffy and *stays* fluffy. Even after hours on the steam table or *days* in the refrigerator. You can prepare it during slack hours, reheat it when the rush begins and make more profitable use of your high-priced kitchen help!

The facts are obvious. Uncle Ben's looks better . . . keeps better . . . and goes further, too. Better order some today.

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Minnesota Dietetic Association. In response to requests from hospital administrators and dietitians, a third regional workshop for food service managers was held May 5 and 6 in the Home Economics Department, Duluth Branch, University of Minnesota. Developed to meet the needs of cooks in hospitals without the services of a professional dietitian, the program offered new techniques in food preparation. Lecture, discussion, demonstration, and group participation were used to acquaint participants with principles of menu planning, food buying, cost control, the use of therapeutic diets, meat and vegetable cookery, and portion control. Also stressed were sanitation, hygiene, and safe working practices. The meeting was sponsored by the *Head of the Lakes Dietetic Association*; the Minnesota Department of Health; and the Minnesota Dietetic, Hospital, and Medical Associations.

Mildred Rieck of the University of Minnesota has been awarded the Minnesota Dietetic Association's $100 scholarship for 1955. Miss Rieck is now a dietetic intern at Scripps Metabolic Clinic, La Jolla, California.

Ohio Dietetic Association. A spring nutrition institute was sponsored by the *Dayton Dietetic* and Home Economics Associations and the Montgomery County Nutrition Council. The program was arranged to include items of interest to professional groups concerned with child nutrition. Speakers included Mary Reeves, Regional Nutrition Consultant, Children's Bureau, Department of Health, Education, and Welfare, Chicago; and Eva N. Ylvisaker, Head Dietitian, Children's Hospital, Cincinnati.

At the regular May meeting of the *Dayton Dietetic Association*, the Diet Therapy Section presented Dr. Jonathan Forman who discussed "Adequate Concept of Health." He expressed the view that "optimal health is available for those who will assume personal responsibility for its capture."

Four members of the *Columbus Dietetic Association* and a dietetic intern took part in a series of radio broadcasts from WOSU (Ohio State University). In the form of interviews, the subjects covered were: commercial food service, the dietetic internship, feeding the preschool child, food fads and fallacies, and hospital food service.

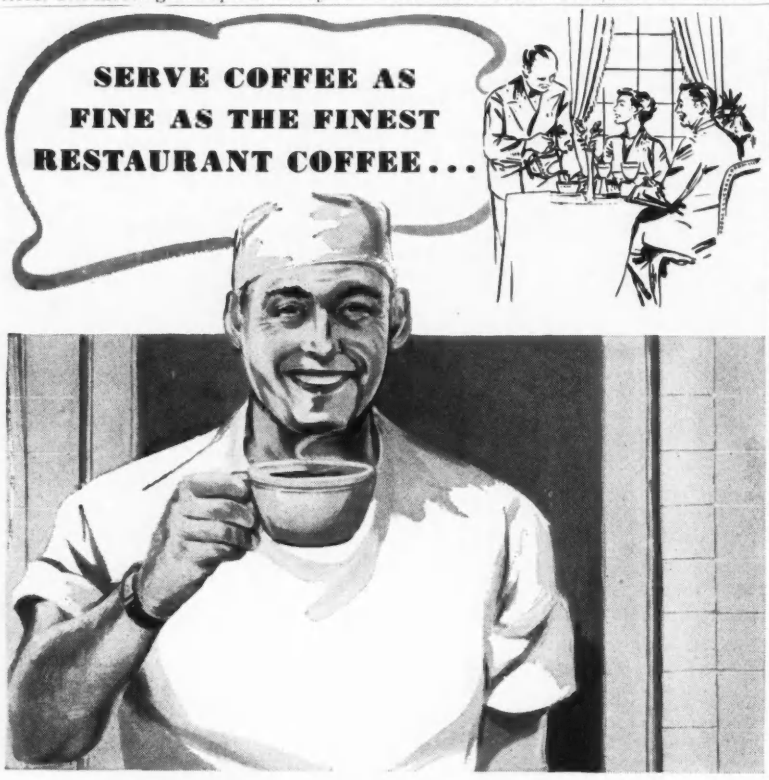
South Carolina Dietetic Association. On March 26, the South Carolina Dietetic Association met in Columbus. Highlight of the meeting was the presentation of an engraved silver card tray to Margaret Freeman, Association President in 1953–54, in recognition of her service to the organization. The Association also endorsed the rice enrichment program being conducted by Clemson College, and elected two new officers for 1955–56, who will be: President-Elect, Mattie Mae Reavis, Chief Dietitian, Anderson Memorial Hospital, Anderson; and Treasurer, Cornelia Whitlock, Chief Dietitian, Orangeburg Regional Hospital, Orangeburg. Installation of these officers will take place at the annual fall meeting to be held jointly with the South Carolina Home Economics Association in Greenville, November 4 and 5.

Washington State Dietetic Association. The Community Nutrition and Diet Therapy Sections of the Washington State Dietetic Associations are jointly working on a project to determine the use of the diabetic exchange system and procedures used in writing other types of modified diets. The Diet Therapy Section is also participating in the revision of the Allergy Recipe booklet and is submitting several recipes which members have tested.

The Association has also been working closely with the state Civil Defense office to prepare a list of daily basic food needs for a 100-bed general hospital in an emergency. June Stein, Nutrition Consultant for the State Department of Health, has served as liaison representative for this work. The results of the committee work, which have been approved by both the Washington State Dietetic and Home Economics Associations, are published in the Summer issue of *The Washington Dietitian*.

Obituaries

Sir Edward Mellanby. The June 25, 1955 issue of the *Journal of the Ameri-*



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When a patient toys with his food, or flatly refuses to eat, chances are it just doesn't taste as good as it *could*. The cure for lack of flavor and jaded appetites is **MSG** (mono sodium glutamate) — "The Secret of Good Taste."

Mono sodium glutamate, an essential natural flavor component of protein foods, is often lost during processing, preparation, or retention on the steam table.

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99+% Pure Mono Sodium Glutamate Crystals

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Available in
10 lb. handsome canisters
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can Medical Association carries an obituary notice of the death of Sir Edward Mellanby in England last January 30, at the age of seventy. Sir Edward, between 1915 and 1919, carried out much of the fundamental work leading to the discovery of vitamins A and D. He also carried out investigations on the toxicity of agenized flour, metabolism of lactating women, and diarrhea and vomiting of children. In 1934 he was appointed Secretary of the British Medical Research Council, and during World War II was a member of the Scientific Food Policy Committee of the British War Cabinet, in which post he strongly influenced the medical aspects of British food policy during the war.

Yvonne Marshall. Word has been received in the A.D.A. office of the death of Yvonne Marshall of Pasadena, California. Miss Marshall, who had been a member since 1952, was formerly employed on the staff of Highland Hospital, Oakland.

Mary Breen Parkes. The A.D.A. office has been notified of the death of Mary Breen Parkes of Quincy, Massachusetts. Mrs. Parkes, who had been a member of the Association since 1943 had formerly been nutritionist for the Visiting Nurse Association, New Haven, Connecticut, for the Rhode Island Department of Health in Providence, and for the Cohasset Social League in Quincy.

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Budgets Need Cutting?

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Economical, easy to use! . . . Naturally, Maggi's cooking aids make low cost dishes taste better . . . transform leftovers into treats, all in a few seconds time! So keep these world-famous products—Maggi's Seasoning and Maggi's Granulated Bouillon Cubes—always on hand!

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News of Products and Services

A new booklet on cottage cheese has just been released by the *National Dairy Council*. Printed in green and black, this sixteen-page booklet is devoted to uses for creamed cottage cheese in salads, dips, spreads, main dishes, breads, and desserts. The recipes are appetizing and easy to follow.

Universal Dishwashing Machinery Company has developed a 180°F. final rinse water booster heated by gas, steam, or electricity for installation on its Model D, all-purpose, small-space dishwasher. This new booster heater will operate satisfactorily at water pressures as low as 5 lb.

Colonial Beef Co. has published "How to Cut Food Costs," a thirty-two page booklet on fresh-frozen, portion-control meats. The booklet serves as the medium to introduce "Redicut," the company's new line of portion-control meats. Each item is illustrated, and purchasing information on weight of serving, number per box, price per serving, and price per box is given.

Anetsberger Brothers has announced a new line of counter food serving equipment comprised of a new Anets counter gas fryer, "Grillators" in various sizes, dry or moist food warmers, hot plates, and a new instant infra-red ray counter broiler. The new units are said to simplify cleaning, promote increased sanitation, and streamline food production. All units are compact and can constitute an entire kitchen on the back bar for efficient preparation and handling of a variety of foods. All are of stainless steel with rims countersunk into the cabinet.

Vulcan Hart Manufacturing Co. is introducing a new electric counter line which is finished in bright chrome with red and gold trim. The equipment can be purchased as a complete battery or by individual units and will fit the requirements of small restaurants, drug stores, coffee shops, and other institutions. The battery includes thermostatically controlled electric griddles available in three sizes—18, 24, and 36 in. widths; electric deep-fat fryer which preheats to 350°F. in 7½ min. and has a capacity of 15 lb.; an electric hot plate; and thermostatically controlled food warmers available in two sizes.

Toledo Scale Company has two new dishwashers, compactly built for installation in counters or dish tables where space is limited. The dishwashers are equipped for straight-through operation with retractable hoods that open from both sides of the machine. Wash tubes are located both above and below dish rack areas, and the revolving rinse arm and lower wash tubes tilt upward as a unit so that basket-type scrap trays can be removed easily. There is a choice of models, both of which are stainless steel. One operates through the entire wash, drip-down, and rinse cycles, and the other permits the operator to control the length of wash and rinse periods. Wash water temperature is maintained by an

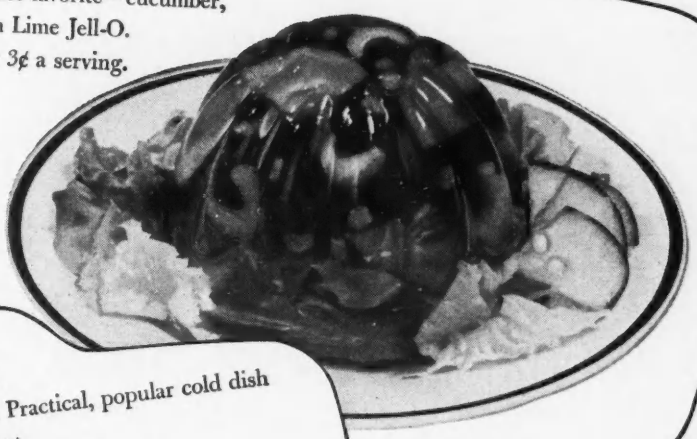
Anywhere on your menu—**JELL-O** rings the bell!

Refreshing cold dessert

Strawberry crème.
Perfect for hot weather.
And features the fruit of the season.

Salad

Spring and summer favorite—cucumber, onions, celery in Lime Jell-O.
Costs you only 3¢ a serving.



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A main course, too

Jellied sea food—shrimp or crab meat. Practical, popular cold dish that's different.

AVAILABLE FROM ALL WHOLESALERS

Jell-O fits anywhere on your menu! More than 8 out of 10 prefer Jell-O and serve it in their homes. Top profits, too! Satisfy your customers by serving the best . . . Jell-O.

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Made by General Foods, makers of Jell-O Pudding and Pie Filling, Baker's Chocolate, Maxwell House Coffee, Post Cereals and other famous foods.

Controlled heating plus counter-height dispensing are combined in heated* AMF Lowerator Dispensers. Heated dishes are a "must" for perfect food service. These units store planned quantities of dishes and cut dish rehandling. Electrical heating elements are thermostatically controlled. For full details write AMF LOWERATOR DIVISION, 261 Madison Ave., New York 16, N.Y.

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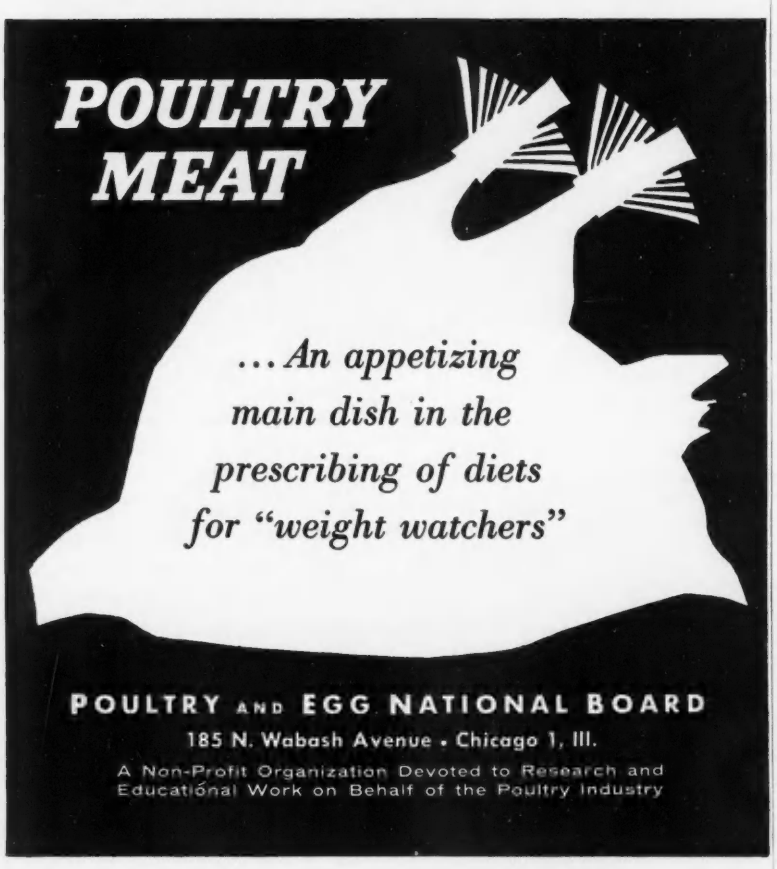
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electric immersion heater. Average capacity is 450 dishes per hour.

A new bench peeler has been announced by the Rochester Division, *Toledo Scale Company*. This space-saving unit is easily moved from place to place, and may be set on work tables, counters, or in sinks where it is convenient to a water faucet. The peeler is electrically powered and requires only 1 to 1¼ min. to peel 15 lb. potatoes. There is a mark timer to control the length of peeling time. The peeling disc has a wavy surface which rotates and tumbles the potatoes to achieve uniform "double action" peeling from the abrasive surfaces on both peeler disc and cylinder wall.

S. Blickman, Inc. has developed two new low-cost, compact coffee urns which provide their own hot water supply. The urns, of all-welded stainless steel construction, come in 3- and 5-gal. sizes, and are low in height to facilitate brewing and cleaning. Called the "Seaweld, Jr." and "Tri-Saver, Jr.," respectively, the urns are designed to eliminate costly installation and deliming and maintenance charges. For cleaning, they may be quickly disassembled. Additional features are an unbreakable stainless steel crevice-free liner, and the inclusion of the burner pre-mounted on brackets to assure correct position. The urns are adaptable for brewing instant coffee, as well as regular coffee and iced tea.

A new electric fry kettle with greater capacity, using less wattage has been put on the market by *Griswold Manufacturing Company*. The kettle will preheat fat to 350°F. in 6½ min., yet use 13 per cent less wattage to maintain that temperature.

Klenzade Products, Inc., is marketing "an entirely new piece of equipment to provide quick, spot-free drying of dishes, glasses, and silverware." Called the Flash-Dri Feeder, the equipment is a positive, continuous-feed, roller-type pump used for injecting Flash-Dri, a liquid drying agent, into the final fresh rinse water of spray-type dishwashing machines. The use of the equipment with Flash-Dri is especially recommended in mixed washing operations and for plastic tableware. The feeder economically proportions and injects the liquid drying agent to speed drying and insure uniform drainage of the rinse water. Streaks and spot formations are thus eliminated to insure sparkling tableware. The Flash-Dri Feeder is a compact unit which can be placed either on top of the dish machine, under the clean dish table, or wall mounted. The feeder reservoir has a capacity sufficient to take care of one complete 10-hr. shift with the final rinse valve operating continuously.

A new catalog by *Duke Manufacturing Co.*, describing Thurmaduke equipment, provides information on temperature settings best suited for each type of hot food kept in food warmers and a brief history of food warming methods. The company's complete line of food service equipment is presented. Featured are the latest models of waterless food warmers in standard, buffet, and portable types for gas or electric operation. Many accessories are shown for the first time.